

JUL 21 1942

Sci Lib

Contractors and Engineers Monthly

Vol. 39, No. 7

JULY, 1942

\$2 a Year, 20 Cents a Copy

Highlights Of This Issue

• Safety Posters Free

Our two-page pictorial spread this month is devoted to Safety in Construction. A limited number of reprints are available on heavier paper for use on your war job bulletin boards by writing to our New York office.

See pages 26 and 27.

• War Construction

The construction industry carries on with speed and efficiency on a wide variety of construction projects essential to the war effort. In this issue are articles describing hot-mix paving for runways at an airport in the south; building earth levees at an important U.S.E.D. flood-control project; the construction of a new municipal water-supply dam made necessary by rapidly expanding war industries; grading on a section of the strategic network in New England; and experimental work in resin-waterproofing the road bases at a Naval air station.

See pages 1, 2, 7 and 15.

• Plant-Mixed Stabilized Base

An unusual and efficient plant set-up for preparing plant-mixed stabilized road base in Minnesota was also used, with the addition of a drier, for preparing the oil-mix top for this 11.2-mile job.

See page 2.

• Road-Maintenance Economies

Two types of work by highway maintenance crews are described in this issue: one is a light oil treatment for laying dust on dirt roads; and the other, the work of Louisiana maintenance forces in rebuilding an old bituminous surface because of the large number of breaks in its surface.

See pages 8 and 40.

• County Road-Mix Work

In a definite program to reduce maintenance costs, Yankton County, S. D., has been streamlining its highway cross-sections, and giving the roads a 1-inch road-mix mat. The methods used in this work are described in this issue.

See page 10.

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IMPORTANT N. H. ROUTE



C. & E. M. Photo
Excavation on U. S. 202. See page 7.

Varied Equipment On Dirt Levee Job

Tuckahoe Construction Co. Used Shovels and Trucks While Acker Had Scrapers

THE bottom-dump truck and trailer-truck loaded by dragline, shovel or elevating grader has long been the standard dirt-moving unit for building earth levees. The Tuckahoe Construction Co.

(Concluded on page 16)

Producing a Hot-Mix With Portable Plant For Airport Runways

(Photo on page 52)

WORK was started on July 1, 1941, on the construction of a paved runway 150 feet wide and 4,000 feet long, another runway 150 feet wide and 3,500 feet long, and the necessary taxiways at a municipal airport in the south. Even before the completion of this 100-calendar day contract, amounting to \$223,012.58, the work was extended to pave both runways 5,000 feet long and construct a third runway 150 feet wide and also 5,000 feet long, with the additional taxiways required, amounting to a total of \$481,081.

The contract involved the placing and compacting of an 8-inch natural sand-clay base in two 4-inch layers paved with a 2½-inch hot-mix binder course and a 1-inch hot-mix surface of sand and crushed natural asphaltic limestone having 4 per cent of natural asphalt. This mixture was composed of two parts asphaltic limestone to one part sand. An additional contract,

All Binder-Course and Top Surfacing Material Mixed in Plant at Site Of Southern Airport

amounting to about \$35,000, was awarded to another contractor for the basic lighting of the field, including contact lights for all runways.

In addition to this contract work sponsored by the Civil Aeronautics Authority and supervised by the U. S. Engineer Department, the city sponsored WPA operations to construct a \$95,000 administration building and machine shop 202 feet x 70 feet, an \$85,000 hangar, with a lean-to for shops, a complete water supply with a 7,500-gallon pressure water tank underground, and a complete system of sewage disposal using a septic tank and intermittent dosing of an underground irrigation system by a Miller syphon. The airport is 801 acres in area, of which 10 acres were recently purchased in order to get rid of some high, obstructing trees at the end of one of the runways.

The Runway Subgrade

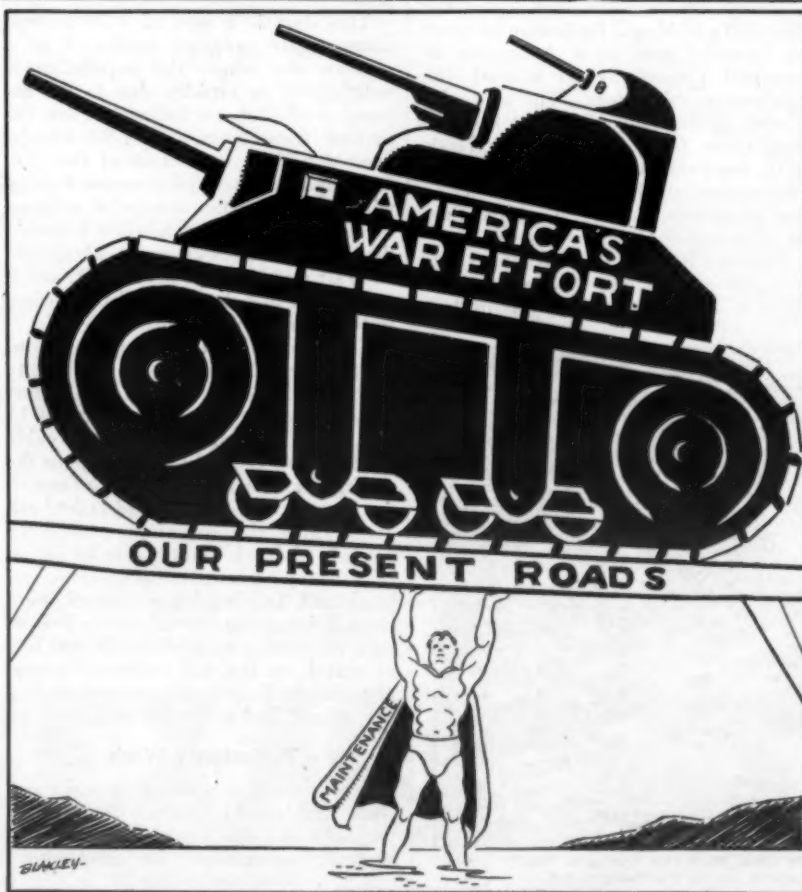
A natural sand-clay sub-base was prepared on the entire area beneath the paved runways by hauling in 8 inches of sand-clay and spreading it in two 4-inch layers. This was mixed in place by disk harrows and bladed with a motor patrol grader. The material was then compacted by a traffic roller and by the trucks hauling over it. The 150-foot width of natural sand-clay sub-base has a 9-inch crown with a 1-per cent grade on each side of the center line. This sub-base was primed with RT-2 coal tar at the rate of approximately 0.3 gallon per square yard, using the contractor's 837-gallon Kinney distributor and 708-gallon Etnyre distributor. The tar was allowed to cure a minimum of three days before it was hand-swept preparatory to laying the binder course.

Aggregates and Asphalt

The aggregates used for the plant hot mix for the binder course consisted of fine sand, coarse sand, gravel and pea gravel. The fine sand was excavated in a pit 1½ miles from the plant set up at the airport, and consisted of a white sugar sand excavated from beneath an overburden of some 10 feet of a red sand-clay. The producer of the hot mix for the general contractor used 9 trucks for this haul, which were loaded by a P & H ¾-yard crane and clamshell.

(Continued on page 28)

DON'T LET HIM BE TOO LITTLE OR TOO LATE



Same Plants Process A Stabilized Base, Hot-Mix Surface

Megarrey Bros. Had Unusual Set-Up for Proportioning Plant-Mixed Base; Added Drier for Oil-Mix Top

(Photo on page 52)

PLANT-MIXED stabilized base for 11.2 miles of highway east of Detroit Lakes, Minn., was produced by Megarrey Bros. of St. Cloud, Minn., with the same crushing and screening plant and pug-mill that they later used for processing the oil-mix top on the same job. The only change was that the crushing and screening plant was moved an additional 40 feet away from the asphalt plant to provide room for the drier.

Testing the Grade

The project was graded in 1940 and then watched during the winter and early spring to correct settlement of the grade and to take care of frost boils. This entailed an extra expense of \$10,000 for the placing of gravel in layers where weaknesses were discovered. Silty spots where the fines seemed to be segregated were cleaned out and filled with coarse gravel. In one place there was a stretch of almost a mile where the subgrade had to be removed to a depth of 3 feet and backfilled with coarse material. This length of road abounded in springs which seeped into the subgrade and caused no end of trouble.

Processing the Clay

In a soil-stabilized base, clay is an important ingredient as it acts as the binder. Even though the clay amounted to a very small proportion of the final mixture of gravel and clay, it was necessary that it be in the proper condition and of the proper consistency for reliable measuring when it was delivered to the plant for mixing with the gravel.

A clay pit was located on the job where a minimum of stripping was required to reach the proper grade and quality of clay. An RD6 with a La-Plant-Choate bulldozer moved the clay back and forth in the pit in windrows to aerate it, dry it and to break it up as much as possible. When the clay was in the proper fine condition, the bulldozer pushed it through a trap onto a belt conveyor which led upward to a Pioneer single-deck vibrating screen. The material passing through the screen was delivered to the single hauling truck which kept the mixer supplied with the proper amount of clay. The belt conveyor and vibrating screen were driven

by an International 10-20 power unit.

The importance of the clay being dry was emphasized strikingly by the fact that tarpaulins were kept spread out at the clay pit ready to cover the aerated clay in case of a sudden rain.

Producing the Gravel

A 4-acre state-owned gravel pit on the job was used by the contractor to furnish all of the gravel for this work. It required the working of only two acres to supply the 70,000 tons of gravel needed. A Caterpillar D7 tractor with a LaPlant-Choate bulldozer was used to feed pit-run gravel to the metered reciprocating feeder of the new Model D40 Pioneer crushing and screening plant, driven by a Caterpillar D11000 power unit. The plant is equipped with a 10 x 36 jaw crusher and a 40 x 20-inch roll crusher which were set for 3/4-inch material when producing aggregate for the upper layer on the road, as shown in the specifications tabulated below, and for slightly larger material for the two lower layers.

Material was carefully selected in the pit to prevent an excess of fines as the specifications covered an average pit-run material. The soil laboratory made tests on the material as delivered to the mixer on an average of one each hour to be certain that the material passed



C. & E. M. Photo

A Caterpillar No. 12 power grader equipped with a Slope-Meter spreading a windrow of plant-mixed stabilized base, followed by a Bros pneumatic-tire roller pulled by an International F-12 tractor.

the specifications.

Plant-Mixing the Base

The stabilized material for the base comprised about 85 per cent of the tonnage on this job, amounting to approximately 70,000 tons while the black top was about 10,000 tons. The contractor had the choice of mixing the materials on the road or of plant-mixing, but chose the latter because of the closer control possible in a single plant set-up.

The specifications for the stabilized base which was laid in three 2-inch layers, each to the exact crown of the finished road, were as follows:

SPECIFIED SIEVE ANALYSIS OF STABILIZED BASE MATERIAL	Lower Layers		Upper Layer
	B & C		A
Per cent passing 1 1/4-inch sieve.....	100	100	100
Per cent passing 3/4-inch sieve.....	80-100	100	95-100
Per cent passing 3/8-inch sieve.....	—	—	95-95
Per cent passing No. 10-mesh sieve.....	65-95	65-95	35-70
Per cent passing No. 40-mesh sieve.....	35-70	35-70	15-40
Per cent passing No. 100-mesh sieve.....	10-25	10-25	6-15
Per cent passing No. 270-mesh sieve.....	6-15	6-15	—

(Continued on page 20)

Foundation for Dam Rock Drilling Problem

A 218-Foot Gravity-Type Concrete Dam Being Built To Supplement Water Supply Of Western City

By FLOYD SUTER BIXBY

(Photos on page 52)

WHEN the late Borglum scaled the lofty cliffs of Mount Rushmore to carve the faces of four great Americans in perpetual granite, he set a mark for high-scaling excavators. The men who blasted off the canyon sides at Boulder Dam came fairly close to Borglum's mark, but today somewhere in the west, a contractor's drilling crew on a concrete dam project is demonstrating that they are high scalers of the same mettle.

Their job involves 100,000 cubic yards of tough granite and diorite, some of which is so hard that drill bits dull in

2 inches of hole. One unit used 100 fresh bits on a 16-foot hole. It is so unpredictably hard and soft that drill footage per bit ranges from a few inches to 10 feet, making the loading of holes extremely difficult to judge. Despite these obstacles, the ever-widening line of the dam foundation is appearing in the canyon walls 240 feet up from the river floor.

This dam is a part of a long-range water-supply program instituted by a western city where the population is multiplying so rapidly, due to the expansion of vital war industries, that the present water supply must be supplemented. The construction of the 218-foot high gravity-type concrete barrier will provide for the storage of millions of gallons of clear, cold river water in the impounding reservoir. A \$2,000,000 contract was let in October, 1941, and it is expected that the dam will be finished in two years from that date.

The dam will set in a high, narrow, rocky gorge 22 miles north of the city which it will serve. It will be 175 feet wide at its base with a crest width of 14 feet, and will contain 306,000 cubic yards of concrete. In order to pour the concrete within the narrow confines of the canyon, access roads had to be built over which the machinery could be hauled. A batch plant had to be set up near the top contour line of the dam, and head and tail cableway towers were erected, involving 10,000 cubic yards of rock excavation to provide for 600 feet of travel on the tail cableway tower. The stream, flowing about 80 cubic feet per second, had to be diverted.

Preliminary Work

After the office, repair shop and warehouse had been built on a plateau below the dam site, the contractor's superintendent concentrated on preparatory

(Continued on page 12)



The gravel processing plant for a new concrete dam, with the conveyor trestle leading across the river. The office and shops are in the foreground.

Save Rubber! Hose Must Last Longer

Simple Rules for Care Of Various Types of Hose Will Lengthen Service And Effect Savings

THE loss of the vital East Indian rubber area has made every ounce of rubber a sacred trust. Because of the important part played by this material in the war effort, it becomes the duty of everyone to conserve rubber by the proper care of industrial equipment in which rubber is used. A great opportunity is offered to users of rubber in the construction industry to observe this duty and at the same time effect operational savings through more efficient maintenance of the various types of industrial hose. The suggestions in this article on the care of rubber have been prepared by K. B. Christie, Production Manager, Hose Department, United States Rubber Co.

Ordering Hose

The proper care of hose starts with its selection. When you order hose, be sure you get the correct type and size of hose for the job. If you are not sure of the proper type, consult a sales engineer. Sometimes there is a temptation to order hose with several more plies than are recommended, with the idea that this will provide a safety factor and increase service life. Actually, the reverse is often true and the hose is harder to handle.

Avoid ordering special hose with rigid tolerances. Production is slow and wasteful when hose is ground to special outside diameter. You can usually change the size of the fitting or attachment so that it will be adaptable to standard hose.

General Treatment of Hose

Sometimes new hose is destroyed by being bent in a small arc close to the fitting. Large heavy hose can be spared this ordeal by a sling or careful support, while small, more portable hose can be treated to a "whip end." This is a relatively short piece of hose coupled at both ends and inserted in the line at any point where severe strain or abrasion or any hazards exist. The whip end takes the punishment and can easily be replaced while the longer sections, leading more protected lives, go on rendering their maximum service life.

When you receive a shipment of hose, you find it carefully packed so that it will arrive in the best possible condition. Unpack the hose just as carefully. Be sure that new hose is not damaged by careless handling of grab hook, knife, pinch bar or chain before it has a chance to start its job.

Like all other rubber products, hose should be stored away from sunlight, heat and ozone. Therefore, your hose storage room should be removed from generators, electric motors, boilers and

(Concluded on page 31)



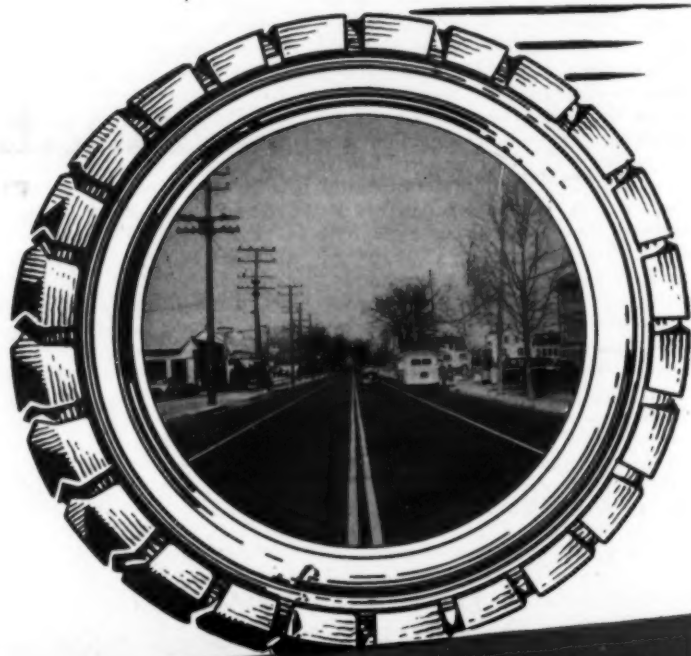
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1500 U.S. cities

Unessential driving on the nation's streets and highways is being cut to the bone.

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of U.S. highways



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Highway and Seaway Safety

His Excellency, Charles Edison, Governor of New Jersey, is the self-appointed champion of more light along our highways, around all plants engaged in the manufacture of munitions and in the skies over New Jersey. He states that less light means more accidents on the highways, dim-outs in communities reduce morale, less light at defense plants reduces protection.

The Governor is undoubtedly correct as far as he goes, but he speaks with only one idea in mind. New Jersey is rightfully proud of her highway safety record, the result of the construction of divided highways on heavy traffic thoroughfares and many miles of highway lighting. But, has His Excellency given proper consideration to the vital traffic of ships, cargo and transport, off the Atlantic coast? He does not seem to realize that vital sea traffic is endangered by the present high illumination along coastal areas. Ball games are good for the morale of war workers, but night ball games in Newark and Jersey City, N. J., contribute to the brilliance of the sky, creating a perfect backdrop to silhouette tankers and other ships in war service, thus making them easy targets for Axis U-boats. These sinkings, which have caused much suffering and are a severe blow to the war effort, are also damaging New Jersey beaches where, it is reported, oil from sunken tankers has ruined many a mile of popular beach.

Certainly, continued safety on the

highway, as well as in industrial plants, is important to national welfare. But motor buses are still rushing over New Jersey highways at speeds far in excess of the legal 40 miles an hour and going between passing cars on roads marked for two-lane traffic; drivers of other motor vehicles are still not showing that courtesy which cuts crashes. Let the excellent corps of New Jersey State Police curb these excesses and then, even should there be less light on their highways near the Atlantic coast, accidents will decline, especially with the decreasing traffic.

Highway lighting has contributed much to a reduction of night accidents, but the greatest safety measure in the world today is winning the war. And this must be done, even if it means sacrificing temporarily those things which have come to represent progress and civilization, lest these things be lost forever. When they have been secured to us and the rest of the world, we can once more turn our attention to a continuation of that peace-time progress.

The Governor of New Jersey may forget about blackouts or dim-outs up in inland Sussex County, but he should not play Hitler's game by creating better targets along coastal counties through the misuse of the quotation from the Book of Proverbs with which he opened his discussion in the May issue of *New Jersey Municipalities*. It is all too true that "Where there is no vision, the people perish."

Who's Hoarding?

"She had over a hundred pounds of sugar when she got her ration card," and "I know a man who has two extra sets of tires in his attic," are frequent remarks heard since scarcity became a fact in the abundant life of our people.

Of course contractors, state and county highway departments, and Federal departments, never hoard—or hardly ever. They will admit that. There are some places, however, where lack of

understanding, carelessness, or over-enthusiasm for a good stock have led to the tying up of considerable material that should be released for use in other places where scarcity means delay in operations.

Take oxygen and acetylene cylinders for example. Producers of these necessary industrial gases for cutting and welding steel and other metals can get no new cylinders for the duration of the war. They are able to produce and ship the gas as rapidly as needed, even with the increased wartime demands, but they must have the cylinders to make the shipments. Are you hoarding empty cylinders? Don't wait until you have a carload, or even a truck-load; return your empties as quickly as possible. If all of you do this, you will be helping each other and no one will get left out in the cold, without gas.

We blush now when we recall the piles of grader blades we saw stacked up in highway garages last summer. "We had some extra maintenance money so we bought about three-years' requirements of grader blades ahead," said one engineer in a well-to-do county. Today, highway departments are begging for blades to be able to carry on for the

(Concluded on page 19)

Maps Are Munitions

In order to fill in the blank spots in the map coverage of all areas outside the continental limits of the United States, all individuals or companies possessing maps or aerial photographs of any foreign areas are requested to communicate with the nearest Foreign Map Section Unit of the Corps of Engineers, U. S. Army, as listed below, and advise the Unit of the material in their possession. Arrangements will be made by any of the Units to examine the material, have copies made where advisable and return the originals to the owners.

Good maps may be of vital importance in any military operation, and the cooperation of all American citizens, either as individuals or as the officials of companies, is earnestly requested.

The addresses and telephone numbers of the various Foreign Map Section Units are as follows:

Foreign Map Section, Corps of Engineers, U. S. Army, New York Unit, Room 820, 1270 Sixth Ave., New York City. Phone, Circle 6-1484.

Foreign Map Section, Corps of Engineers, U. S. Army, New Orleans Unit, Room 900-A, Maritime Bldg., New Orleans, La. Phone, Magnolia 4006.

Foreign Map Section, San Francisco Unit, Room 546, 74 New Montgomery St., San Francisco, Calif. Phone, EXbrook 2009.

Foreign Map Section, Intelligence Branch, Office of Chief of Engineers, U. S. Army, Room 3166, New War Department Bldg., 21st & Virginia Ave., Washington, D. C. Phone, Republic 6700, Ext. 5234-6409.

Price Control

This is the title of a recent publication issued by the Research Institute of America, Inc., analyzing the general price regulations of the Office of Price Administration and their effect on business and individuals in this country. It is important that every businessman become familiar with the general pattern of price control and the details of how it applies to his particular business.

Ordinarily, the analyses prepared by the Research Institute of America, of which "Price Control" is only one in a series, are available only to members



Hey! There was a five-cent deposit on that bottle!

of the Institute. But because of the urgency of the times and the Institute's belief that this study will contribute something to better adjustment in the new business-government relationship, copies of "Price Control" are being made generally available.

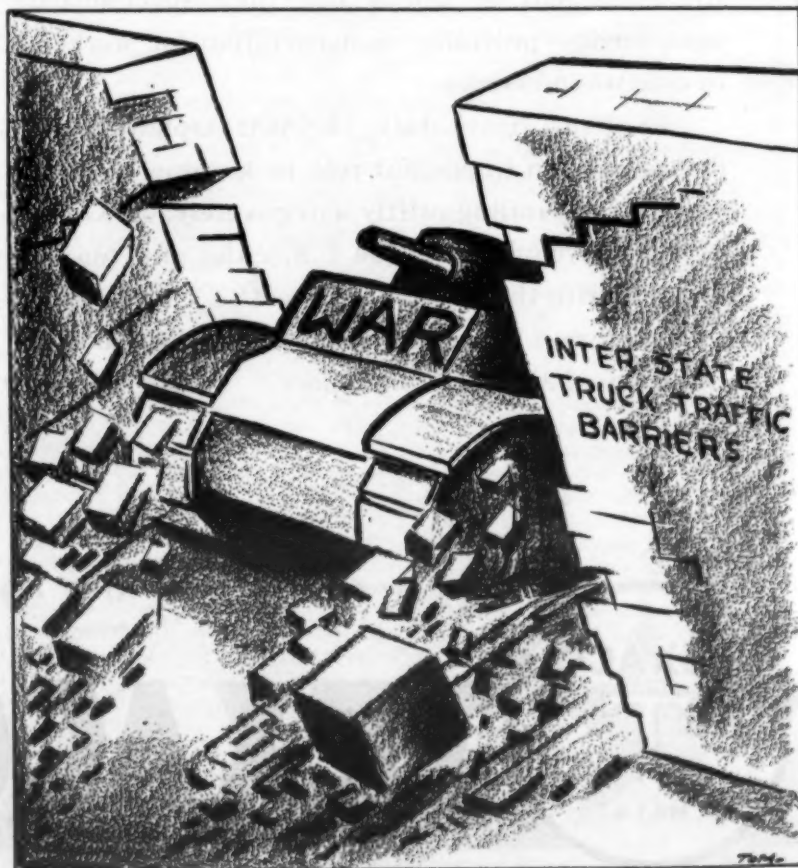
Those interested may secure copies from the Research Institute of America, Inc., 292 Madison Ave., New York City. Price: \$2.00 a copy.

War Traffic Speeded By State Agreements

Announcement has been made by Secretary of Commerce Jesse Jones that the governors of all forty-eight states have agreed to reciprocal licensing arrangements for motor transportation "for the duration" and to uniform minimum standards of motor-vehicle sizes and weights. The standards became effective immediately, in most states by governors' proclamations.

The new size and weight recommendations follow closely the recommendations of Commissioner Thomas H. MacDonald of the Public Roads Administration, made before the recent Federal-State Conference on War Restrictions at Washington, D. C. In presenting these specifications, Commissioner MacDonald said: "When our national security depends on the full utilization of all our transportation facilities, interference with the reasonable movement of motor carriers should no longer be tolerated."

CRASHING THROUGH



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Off-Shore Base
St. Lucia, B.W.I.

Bomber Base
Georgetown, British
Guiana

Detonator Plant
No. Little Rock, Ark.

Erie Proving Grounds
Port Clinton, Ohio

Air Base
Austin, Texas

Off-Shore Base,
Kingston, Jamaica,
B.W.I.

Plum Brook Ordnance
Plant
Sandusky, Ohio

Air Base
Valdosta, Georgia

Naval Air Station
Argentia,
Newfoundland

Twin Engine Flying
School
Barretts, Georgia

Pacific Naval Air Base
Pearl Harbor, T. H.

Georgia Air Depot
Wellston, Georgia

Marche Ordnance Plant
Marche, Arkansas

Brookley Air Field
Brookley, Alabama

Army Regulating Sta.
Voorheesville, N. Y.

Wright Field
Dayton, Ohio

Marine Barracks
New River, N. C.

Tyndall Field
Panama City, Florida

San Jacinto Ordnance Depot
Houston, Texas

Army Air Base
Fort Gulick, Canal Zone

Muroc Bombing Range
Muroc, Calif.

Smyrna Air Base
Smyrna, Tennessee

Ford Bomber Plant
Ypsilanti, Michigan

Off-Shore Base
Castries, St. Lucia, B.W.I.

Flexible Gunnery School
Harlingen, Texas

Aircraft Assembly Plant
Tulsa, Oklahoma

Haward Field
Cristobal, Canal Zone

Ravenna Ordnance Plant
Ravenna, Ohio

Mid-West Air Depot
Marion, Oklahoma

Army Air Base
Rapid City, South Dakota

Aircraft Assembly Plant
Fort Worth, Texas

Tank Plant
Warren, Ohio

Watervliet Arsenal
Watervliet, New York

Fisher Body Tank Division
General Motors Corp.
Detroit, Michigan

Westover Field
Chicopee Falls, Mass.

Bombardier School
Midland, Texas

Aviation Shore Facilities
Naval Air Station
Norfolk, Virginia

Lone Star Ordnance Plant
Texarkana, Texas

Kingsbury Ordnance Plant
Kingsbury, Indiana

Air Corps Basic Flying Schl.
Sumter, South Carolina

Flying School #6
Albany, Georgia

Naval Ordnance Plant
So. Charleston, W. Va.

Air Depot
Barksdale, Louisiana

Army Cantonment
Fort Belvoir, Virginia

Wolf Creek Ordnance
Plant
Milan, Tennessee

Army Depot
Tallahassee, Tennessee

Marine Air Base
Cherry Point, N. C.

U. S. Army Supply
Depot
Marisita, Pennsylvania

Flying School
Enid, Oklahoma

Chrysler Tank Plant
Detroit, Michigan

Naval Base
Corpus Christi, Texas

Jefferson Proving
Ground
Madison, Indiana

San Bernardino Air
Depot
San Bernardino, Calif.

Borinquen Air Field
Puerto Rico

Gardner Air Field
Gardner, Kansas

Rome Air Depot
Rome, New York

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Wooden piles equipped with American all-steel pile shoes were driven through the remains of old ship hulks in the construction of new shipways and trestles.

Pile-Driving Problem At Eastern Shipyard

A very unusual foundation job was recently completed by the Lake States Engineering Co., of Chicago, at an eastern shipyard, involving the construction of several new shipways and trestles over a site where sunken ships' hulks had been lying for many years.

The engineers decided to drive the wood foundation piles through the old hulks. To avoid delays and possible splintering of these 95-foot wood piles, American all-steel pile shoes supplied by the American Pulley Co. of Philadelphia were used. It is reported that the piles equipped with these steel shoes or pile points were driven straight through the sunken hulks to predetermined depths rapidly and economically.

More Opportunities For Small Contractors

The latest policy of the Corps of Engineers to award future contracts by negotiation, following the receipt of informal bids from selected qualified contractors, is a wartime expansion of the authority which the Corps has had since 1940. Contracts will not necessarily be awarded to the lowest bidder because speed of completion and the availability of equipment will be important considerations.

Unusually difficult operations will rightfully go to the larger contractors whose past performances have indicated their ability to cope with new and challenging conditions. On the other hand, the more routine operations may go to the smaller contractors who are still well equipped. A requirement for every new bid will be a listing of the

equipment which the contractor must lease or buy in order to handle the job properly within the time limits set. The best qualified individual contractor, or group of contractors, with the proper qualifications, ability, and equipment

which will require the minimum of transportation by rail or road, will get the job even if the bid is not the lowest. It is even suggested that prices will be adjusted downward by negotiation after the contractor is selected for the job.

Are you registered with your nearest Division or District Office, Corps of Engineers, U. S. Army, in order to qualify for these invitations to bid on future war construction?

Welding Rod Altered To Conserve Nickel

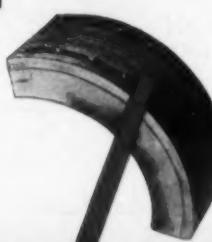
In order to conserve nickel for our war effort so that it can be used in munitions production, the American Manganese Steel Division of The American Brake Shoe & Foundry Co., Chicago Heights, Ill., has announced a new manganese steel welding rod known as V-Mang. This rod is a result of research started by Amsco's metallurgists several years ago in their constant endeavor to develop a better welding rod.

The new development is an alloy steel containing 12 to 14 per cent manganese, molybdenum and other elements. It will replace Amsco nickel-manganese steel electrodes, except in a few exceptional cases, thus conserving the critical metal, nickel, without hampering reclamation of manganese steel and other ferrous equipment parts which are so necessary at this time. Amsco announces that even though molybdenum is costlier than nickel, the new V-Mang rod will be priced the same as the Amsco nickel-manganese steel rod.


V-Mang does not replace Amsco Mo-Mang, a high-manganese high-carbon molybdenum rod that is not as ductile as the new rod and is recommended for build-up work only. V-Mang is available bare and coated in 1/8, 5/32, 3/16 and 1/4-inch diameters in 18-inch lengths. The standard waterproof-paper-lined wooden boxes contain 50 pounds of rod.

Further information on this rod is available from the manufacturer on request to those referring to this item.

On the Rollers Off the Brakes

Right: Timken Bearing after 34,000 miles of service; rollers still protected with heat-resisting, wear-defying Texaco Marfak Heavy Duty.



On the rollers - off the brakes.

AMERICA'S fleet operators are getting a safer braking, increasing the life of wheel bearings, and saving valuable man-hours of repacking time . . . by lubricating their wheel bearings with Texaco Marfak Heavy Duty.

Texaco Marfak Heavy Duty stays in the bearings, protecting against friction, despite the highest operating hub temperatures. It stays off the brake lining in hottest summer weather, yet functions perfectly in the coldest winter weather.

The outstanding performance that has made Texaco preferred in the fields listed in the panel has made it preferred on prominent construction jobs throughout the country.

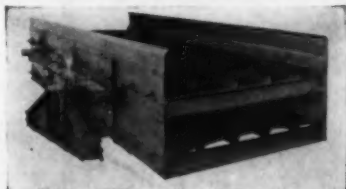
These Texaco users enjoy many benefits that can also be yours. A Texaco Automotive Engineer will gladly cooperate . . . just phone the nearest of more than 2300 Texaco distribution points in the 48 States, or write: The Texas Company, 135 East 42nd Street, New York, N. Y.



Tune in the TEXACO STAR
THEATRE every Sunday
night—CBS

Care for your Car
...for your Country

"X-RAY" CATALOG on GYREX SCREENS



Send for Your FREE Copy Today!

The first few pages of ROBINS new X-Ray Bulletin No. 115 are printed on separate transparent sheets and show the various important parts of the well-known ROBINS-GYREX Vibrating Screen. Together these pages make up a complete screen; but taken separately they permit the reader to study each element of construction and design independently of the rest.

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PASSAIC, NEW JERSEY

Please send me a copy of X-Ray Bulletin No. 115 ROBINS-GYREX Vibrating Screens.

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★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.



TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

New Link Completed In U.S. SN Highway

A 14-Year-Old Wooden Main Controlled Organizing Work Of John Iafolla Const. Co. In Town of Epsom, N. H.

(Photo on page 1)

A RURAL highway job hung on a water main is unusual, but that is just what controlled the grading of a 5.5-mile military-highway contract awarded to John Iafolla Construction Co. of Dedham, Mass., in the summer of 1941, and completed in June, 1942. The job ran through the Town of Epsom, N. H., (no relation to the salts) on U. S. 202, involving considerable improvement in grade and alignment which exposed the old 12-inch wood-stave water pipe of the Pembroke Water Department in several locations.

In order to replace the old main with a new 14-inch cast-iron pipe for about 14,000 feet, it was necessary to complete certain fills on new locations and cuts so that the new pipe could be installed before the old line was cut and removed. This created several interesting situations. At one point where the new grade required a cut of 10 feet for the improvement it was necessary to cut a trench 15 feet deep for the new water main so that it could be installed before the old one was disturbed. At another point the new grade was below the old and slightly to the south of the old road so that the wood-stave water main was several feet up on the shoulder on the north side of the road. At the east end an intercepting ditch was cut to take care of water coming down the hillside. A stoppage in this ditch diverted the water back through several hundred feet of this old water main which of course was not supplying water to the communities at the time but which had not been removed for final disposal. Wherever the old wood main, which had been in service for more than 28 years, was under the new pavement it was removed, and the trench backfilled before the new pavement was completed.

The Grading

One section of this highway about 3,900 feet long, starting about 1 mile

from the east end of the contract, was built in 1933 as an NRH project. On this section the new work included widening, improvement in alignment, additional sub-drainage, additional gravel and the pavement. About all that was salvaged from the old job was the original gravel.

On this contract the maximum fills ran about 20 feet, there was one cut varying from 15 to 18 feet deep, and there were two military widenings each 2,000 feet long. These consisted of an additional 9 feet beyond the standard 3-foot shoulder where there is guard rail, the balance of the shoulder being only 2 feet wide. All of the fills less than 7 feet in height were made with 4 to 1 slopes, thus eliminating the need for guard rail, and they were put down in 12-inch layers. The



C. & E. M. Photo

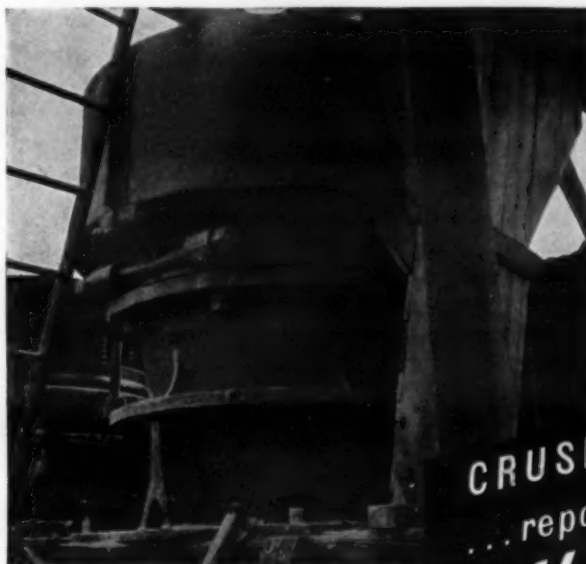
The muck wave blown out from beneath the surcharged fill on the north approach to the traffic circle at the junction of U. S. 202 and N. H. 28.

new road consists of a 30-foot pavement where it runs through settlements and in the rural sections is 24 feet wide.

The initial grading was started August 4, 1941, with work on the fills required to take care of the new water pipe as mentioned above. The contractor started

out with a 13 1/4-yard Lorain diesel shovel for the first two months, and a Lorain 40 equipped with a trench hoe to excavate the trench for the new cast-iron pipe. Work was started where the water main entered U. S. 202 and was continued east-

(Continued on page 34)



13-B Tel Smith Gyratory Crusher

RALPH E. MILLS, of Roanoke, Va., who heads the general highways contracting firm bearing his name, owns the completely modern Tel Smith-equipped Arlington Stone Co. plant at Leesburg, Va. He not only knows highway construction and materials, but the kind of quarry plant equipment best suited to turn out crushed stone for highway construction.

CRUSHING 190,595 TONS
... repair parts and labor cost
1/10¢ per Ton
WITH THIS
TELSMITH
CRUSHER

Has Mr. Ralph E. Mills' choice of Tel Smith equipment for his own quarry plant been justified by results? Let's look at the record of the 13-B Tel Smith Gyratory Crusher. Used as an intermediate crusher for plus 2 1/2", it takes the feed from the primary at 80 to 90 tons per hr.

From the start of plant operations, Sept. 1, 1939, to Dec. 31, 1941, this Tel Smith Crusher worked 3,941 hours, and crushed 190,595 tons. Repair parts cost \$126.77. Labor charged to crusher maintenance: \$55.73. Total crusher upkeep for 16 months: \$182.50—less than 1/10¢ per ton! And the stone crushed is particularly hard and abrasive.

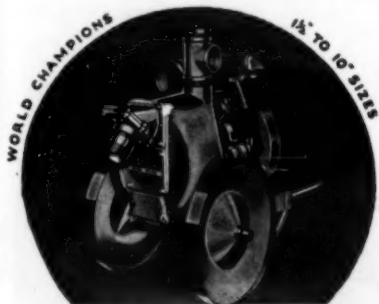
"Cost of lubricating oil is not included," says Mr. Mason M. Schoolfield, Plant Supt. "The figures do include all manganese costs—because there haven't been any. It is still operating with the original concaves and mantles. We bought two sets of concaves, one standard, the other extra thick to make smaller stone... the extra thick set has operated about four-fifths of the time. Both sets are still in good condition. The largest single item in the above cost figures was not crusher parts at all, but a new set of V-belts. In view of the type stone we are handling here, I think the figures are very remarkable!" You can get results like this in your plant—with Tel Smith equipment! Get Bulletin Q-34.

SMITH ENGINEERING WORKS, 4014 N. HOLTON STREET, MILWAUKEE, WISCONSIN

Room 1604—50 East 42nd St. New York City	211 W. Wacker Drive Chicago, Ill.	713 Commercial Trust Bldg. Philadelphia, Pa.	19-21 Charles St. Cambridge, Mass.	Blake Equipment Co. Columbus, Ohio	Brandeis M. & S. Co. Louisville, Ky.
Charleston Tractor & Eqp. Corp. Charleston, W. Va.	Roanoke Trac. & Eqp. Co. Roanoke, Va.	North Carolina Eqp. Co. Raleigh and Stateville, N. C.	Wilson-Weener-Wilkinson Co. Knoxville and Nashville, Tenn.	G. F. Sealey & Co. Toronto, Ont.	



Minus 2 1/2" material passing grizzly, and discharged from 13-B Tel Smith Gyratory Crusher, drops onto 28' x 35' Tel Smith Belt Conveyor, is carried to Tel Smith No. 7 Belt Elevator with 43' centers and goes up to two 4' x 10' Tel Smith Pulsator Screens (left) over storage bins. Any one of the five finished products can be re-conveyed from bins to the Tel Smith No. 36 Gyro-sphere Crusher (right), with Tel Smith Gyratory on extreme right for re-crushing into 3/4", 1/2" or 3/8" chips.



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THE JAEGER MACHINE CO.
761 Dublin Ave., Columbus, Ohio

Light Oil for Dust And MC-1 for Binder

Division 18 of Ontario Highways Tries Road Oil, and Cut-Back on 10 Miles of Main Highway Where Sandy Soil and Gravel Predominate

† FOR most of Ontario Highway 17 in Division 18 of the Ontario Department of Highways, where the road runs through sandy country, a light dust-layer type of road oil has been tried to eliminate the cloud of dust which is such a hazard to motor traffic. The soil is mostly sand and gravel with very little clay except where it has been added as a binder. The oil has been applied at the rate of 0.2 gallon per square yard, and has been quite successful when applied once each year after the frost has left the ground. The material, however, does not remain in the road or give any binding quality, but simply makes the dust heavier so that it does not form the hazardous cloud.

The oil is purchased on contract by the Division for delivery at designated sidings. Then a contract is entered into with different contractors who have distributors and who apply the oil the full 20-foot width of the highway. The gravel is not removed from the road when applying the oil.

These roads regularly require from 100 to 200 cubic yards of gravel per mile each year as part of the regular maintenance, so that the oil does not have any opportunity to build up a bond in the gravel because the amount which is added each year represents that which is lost by scattering because of high-speed motor traffic.

In an endeavor to improve on this method of dust-laying, 10 miles of highway extending 2 miles west and 8 miles east of Massey was treated with 0.2 gallon per square yard of MC-1. The gravel float was bladed off the stabilized section first and spread on the shoulders, then the oil was applied and covered with a light application of sand. The result of this has been what appears on first inspection to be a 1/4-inch bituminous surface course, and the pavement rides similar to a bituminous stone-filled sheet.

The treatment of this road has been

quite successful. In the early stages patching was not carried out with the proper materials and the surface became badly pitted, but about the middle of last July District forces began using a mixture of crushed gravel and mixed-in-place. The holes were filled loosely with this material and consolidated by traffic, with the result that in August the whole road surface was in excellent condition and remained so throughout the winter. As was expected, the surface broke up on certain sections during the spring and had to be scarified and reshaped before retreatment. One essential in retaining a good surface is to have patching material ready beforehand. From information received from other Divisions which have carried out this type of surfacing for three or four years, the cost of patching is considerably less after the first year.

The advantages of this type of surfacing are that it provides a road free from dust at not much greater cost than that of maintaining a gravel road, and that a considerable saving is effected in

the annual replacement of gravel.

This work was carried on under the direction of A. L. McDougall, Division Engineer, Division 18, Algoma and Sault Ste. Marie District, with headquarters at Blind River, Ontario.

Maximum Price Set Up For Reinforcing Steel

A maximum price regulation for fabricated concrete reinforcing steel was announced on June 10, 1942, by Price Administrator Leon Henderson. This Maximum Price Regulation No. 159, which became effective June 15, establishes, as a ceiling, prices based on an allowance to the fabricator of a margin of 50 cents per 100 pounds of bars over and above the cost of the bars to the fabricator at the steel mill, excluding freight and extras. These are the prices at or under which approximately 75 per cent of the nation's fabricators were operating in April, 1941.

The pricing provisions of the regulation pass on to the consumer all charges

for freight from mill to fabricator and from fabricator to consumer. There are, however, two modifications of this rule: (1) where a fabricator obtains an advantage as the result of an "in transit" freight rate, this advantage must be passed on to the consumer; and (2), where delivery is made by truck instead of by railroad, an arbitrary charge of 10 cents per 100 pounds may be made.

New Road-Roller Catalog

A 16-page catalog describing and illustrating the latest models of Austin-Western tandem and three-wheel road rollers and Roll-A-Planes has recently been issued by the Austin-Western Road Machinery Co., Aurora, Ill. Construction features and specifications are included and the illustrations include pictures of parts and assemblies as well as on-the-job photos.

Copies of this new A-W road-roller catalog may be secured by contractors and state, county and town road engineers direct from the manufacturer.

LORAIN HEADQUARTERS ARE IN THE FIELD

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Genuine Thew-Lorain factory made parts can save repairs, increase the life of your Lorain. Many distributors carry a representative stock, and are "Johnny-on-the-spot" 24 hours a day.



Typical parts department of a Lorain Distributor.

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REBUILDING—You can prolong the life of much machinery by rebuilding it in time. Lorain distributors employ expert service men who know Lorain equipment—know how to rebuild it properly.

CLEARING HOUSE—If you want information on rentable equipment or booms that you may need for converting present machines, see your Lorain distributor. He knows what is in the territory and what is available.



YOUR RESPONSIBILITY

is to keep your equipment working every minute. When problems arise, we urge you to use Lorain Distributor Service. There is a distributor near you—ready, willing and able to help you make your equipment last longer and work faster.

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SYNTRON CO.

227 Lex. Ave. Homer City, Pa.

New Simplified Catalog On Brake Blocks and Liners

A new catalog covering its line of brake blocks and liners for trucks, tractors, trailers, and other heavy-duty equipment has recently been announced by the Gatke Corp., 224 No. LaSalle St., Chicago, Ill. For quick reference, the parts numbers of Gatke Custom-Bilt brake block sets are alphabetically listed by make, year and model.

In addition, special recommendations give specifications of liners required for each shoe, with suggestions for meeting emergency requirements with multiple coverage sets. The many alternate meth-

ods of properly meeting the requirements for seldom-called-for part numbers facilitate instant service with minimum stock.

Copies of this catalog may be secured by interested contractors and engineers direct from the Gatke Corp. or from this magazine.

Periodical on Welding

A recent issue of *Welding Briefs*, published by the Metal & Thermit Corp., 120 Broadway, New York City, opens with an article on "how you can relieve the electrode shortage and speed up your own fabrication besides." One impor-

tant step, according to the article, is to use the largest sizes of rods that are practical for their applications. Another is to specify, wherever possible, all-mineral coated electrodes in place of those with organic-type coatings. Electrode production will thus be expedited by enabling electrode manufacturers to concentrate on the larger sizes of all-mineral coated rods which can be produced more rapidly.

Copies of this periodical, which is published every other month and is devoted to the concise digest of interesting industrial applications of electric arc welding and Thermit welding, together with occasional sidelights on the uses of

Metal & Thermit products in other industries, may be obtained by writing direct to the Metal & Thermit Corp.

New Kotal Dealer

The appointment of the Union Building & Construction Corp., Passaic, N. J., as a distributor for Kotal, the waterproofing compound used in bituminous maintenance and construction, has been announced by the Kotal Co., 52 Vanderbilt Ave., New York City. This new distributor is headed by Dow Drukker, who is personally directing the sale of Kotal, Kotal-treated aggregate and Kotal asphalt mixes in New Jersey.



JUNGLE FIGHTER!

Like a wire entanglement, a matted thicket lies across our Army's path to a vital objective. "Bring on the tractors!" is the call of the fighting Engineers.

With tusks of steel and more power than a herd of elephants, the "Caterpillar" Diesels move in. With broad, deep-grousered tracks providing a firm foothold, they drive their bulldozers forward in mighty thrusts — toppling trees, uprooting stumps, sweeping them aside together with brush and rocks. . . . The Infantry, guns and tanks are going through!

On scores of other battle-front jobs, "Caterpillar" Diesel Tractors are helping to deliver similar blows for the cause of free peoples. Building military roads, causeways,

bridge-heads, fortifications, gun emplacements; rescuing mired trucks and disabled tanks; moving heavy artillery — are some of the assignments. . . . Because "Caterpillar" Diesels are built with the power, stamina and dependability to see things through!

And there are many more on the way! As fast as "Caterpillar" production can turn them out, all "Caterpillar" products—tractors,

motor graders, engines and electric sets—will be available to serve in this all-out war.

Those already doing useful work in supporting fields—oil, mining, lumber, construction, manufacturing, transportation, agriculture and other essential industries — will have all the replacement parts and mechanical service "Caterpillar" and a world-wide dealer organization can provide to keep them fighting.

CATERPILLAR DIESEL

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

TO WIN THE WAR: WORK—FIGHT—BUY WAR SAVINGS BONDS!

Road-Mix Projects In Yankton County

**F. W. Smith, Superintendent,
In Interview Outlines the
Details of Black-Top Work
In South Dakota County**

CONTINUING a definite program to reduce maintenance costs, F. W. Smith, Highway Superintendent of Yankton County on the southern border of South Dakota, is streamlining every mile of road possible to cut snow plowing, and is pressing the road-mix, black-top program. With a minimum 80-foot right-of-way as standard, the roads are given a 26-foot crown, a 3 to 1 front slope and then the backslopes are cut 2 to 1 out to the right-of-way line, with a varying ditch width. The original road design was a 60-foot right-of-way, 1 to 1 slopes and a 2½-foot ditch. Now, with the streamlining and widening program, black-topping has been started on 18 miles of the 275 miles in the county system. All of these roads are graded and graveled up to the old standard.

Making the 1-Inch Mat

When a road is to be given the 1-inch road-mix mat, the base is carefully checked to determine the amount of gravel. This is usually found to be about 2 inches and enough crushed gravel is added to bring up the top to a 4-inch layer of gravel, which is stabilized with clay and water mixed by power blades and compacted by a steel roller. When this is completed, the surface is swept clear of excess fines with a Hough rotary broom, leaving the material in windrows. The surface is then primed with SC-1 asphalt at the rate of about 0.33 gallon per square yard or slightly less. Traffic is either detoured or, if that isn't possible, one half of the road is primed at a time so that traffic is kept off this prime for 24 hours. Then the fines are swept back over the prime to act as a blotter, and the road is good for a month or so before the 1-inch mat is placed.

When it comes time to start the 1-inch mat, about 400 yards of crushed gravel per mile is windrowed down the center of the 24-foot roadway, and fines are added to give the proper gradation. These fines are material passing a 200-

mesh sieve and consist of silt, not clay. The gravel and fines are mixed by blading, windrowed, the windrow flattened, and then shot with SC-5 three times, at about 0.2 gallon per square yard each time, until 5 per cent asphalt by weight has been added to the windrow. The windrow is mixed with two power graders, the first of which folds in the asphalt as soon as it is applied. Five or six round trips of the two blades usually complete the mixing. The windrow is then spread and rolled at once, using pneumatic-tired rollers for the initial compaction, and finishing with the steel-wheel roller.

The mat is left for 10 days to 2 weeks. If any rich spots develop, they are blotted at once with sand. At the end of this period the surface is cleaned with the



C. & E. M. Photo
The new Central Garage of Yankton County, S. D., nearing completion.

rotary broom and given a fog coat of SC-5 asphalt, heated to about 140 degrees Fahrenheit and applied at the rate of ½ gallon per square yard. This is allowed to penetrate the surface while traffic is kept off the road, and then the excess fines are swept in from the sides to cover the fog coat after it has penetrated the surface.

The actual sealing of the surface is not done for several months after this.

The surface is again swept and shot with RC-2 asphalt at 0.3 gallon per square yard, one half the road at a time, and then covered immediately with ½-inch crushed-aggregate chips applied by a box spreader at the rate of about 100 tons per mile of road surface and rolled immediately by the steel-wheel roller to key the chips in the road.

Mr. Smith points out that this 1-inch

(Concluded on page 37)



WINNING EFFORT

demands full time performance from equipment. **CONSTRUCTION MACHINERY** delivers utmost yield of service hours when lubricated with . . .

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Advisory Committee**Appointed by WPB**

The Bureau of Industry Advisory Committee of the War Production Board has announced the formation of an Over-all Construction Machinery Industry Advisory Committee, with Joseph F. Ryan, Chief, Construction Machinery Branch, WPB, as the Government Presiding Officer.

The members of the Committee are: P. H. Birkhead, General Sales Manager, Bucyrus-Erie Co., South Milwau-

kee, Wis.; Ralph E. Boyd, Vice President, Galion Iron Works & Mfg. Co., Galion, Ohio; Neal Higgins, Government Sales Manager, International Harvester Co., Chicago, Ill.; John H. Jay, President, Quickway Truck Shovel Co., Denver, Colo.; J. F. Richardson, Secretary, The Buffalo-Springfield Roller Co., Springfield, Ohio; Carl H. Frink, owner, Frink Snow Plows, Clayton, N. Y.; Lion Gardiner, Vice President, Jaeger Machine Co., Columbus, Ohio; Thorman W. Rosholt, President, Rosco Mfg. Co., Minneapolis, Minn.; Harold G. Smith,

Executive Engineer, The Buda Co., Harvey, Ill.; C. B. Smythe, Vice President, Thew Shovel Co., Lorain, Ohio; and Larry B. West, owner, the Simplicity System Co., Chattanooga, Tenn.

Campaign Against Waste

As part of its campaign against waste of oxygen in welding and cutting operations, Air Reduction Sales Co., 60 East 42nd St., New York City, is offering two posters for display in plants and shops where oxyacetylene processes are used.

These posters dramatize oxygen's importance to war production and emphasize the need for its conservation and for the speedy return of cylinders. No advertising appears on either poster. They are printed on light-weight paper stock, permitting easy mounting anywhere in the shop. Eye-catching colors and illustrations give both pieces high attention value.

Free copies will be sent postpaid in any quantity desired by writing direct to G. Van Alstyne, Air Reduction Sales Co., and mentioning this item.

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Keep your buckets handling more material—doing more digging. Your nearby Blaw-Knox dealer is trained to diagnose bucket ills. Let him inspect yours today! The life of your bucket can be prolonged.

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San Francisco.....C. H. Grant
COLORADO Denver.....Ray Corson Machinery Company
DISTRICT OF COLUMBIA Washington.....Matt A. Doetsch Machinery Company
FLORIDA Jacksonville.....Quinn R. Barton, Inc.
Marianne.....Berry & Brown, Inc.
Miami.....East Coast Equipment Company, Inc.
Tampa.....Epperson & Company
GEORGIA Atlanta.....W. C. Cope & Company
IDAHO Boise.....Intermountain Equipment Company
ILLINOIS Chicago.....O. T. Christerson Company
INDIANA Indianapolis.....Reid-Holcomb Company
IOWA Des Moines.....Gierke-Robinson Company
Des Moines.....Herman M. Brown Company
KENTUCKY Louisville.....Brandeis Machinery & Supply Co.
LOUISIANA New Orleans.....Southern States Equipment Co.

MAINE Portland.....Stanley & Cadigan Company
MARYLAND Baltimore.....Henry H. Meyer Company, Inc.
MASSACHUSETTS Boston.....The Equipment Company
MICHIGAN Detroit.....William F. Favorite Company
Grand Rapids.....Contractors Machinery Company
Iron Mountain.....Service & Supply Division
MINNESOTA St. Paul.....Borchert-Ingersoll Company
MISSISSIPPI Amory.....Dalrymple Equipment Company
MISSOURI Kansas City.....G. W. Van Keppel Company
St. Louis.....O. B. Avery Company
MONTANA Billings.....Western Construction Equipment Co.
NEBRASKA Omaha.....Anderson Equipment Company
NEW MEXICO Albuquerque.....Power Equipment Company
NEW YORK Albany.....Larkin Equipment Company
Buffalo.....Trevor Corporation
New York.....R. E. Brooks Company
NORTH CAROLINA Raleigh.....Carolina Tractor & Equipment Co.
Salisbury.....Carolina Tractor & Equipment Co.
NORTH DAKOTA Fargo.....Dakota Tractor & Equipment Company

OHIO Cleveland.....H. B. Fuller Equipment Company
Columbus.....The W. W. Williams Company
Cincinnati.....The W. W. Williams Company
OKLAHOMA Oklahoma City.....Leland Equipment Company
Tulsa.....Leland Equipment Company
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Pittsburgh.....Dravo-Doyle Company
SOUTH CAROLINA Columbia.....Jell Hunt Road Machinery Company
TENNESSEE Chattanooga.....Nixon-Hassell Company
Knoxville.....Wilson-Woodman-Wilkinson Co.
Nashville.....Wilson-Woodman-Wilkinson Co.
TEXAS Dallas.....Conley-Lott-Nichols Machinery Co.
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Job Set-Up and Rock Work For Concrete Dam Project

(Continued from page 2)

work. It was decided to divert the river through a flume, with concrete cut-off walls at the intake and discharge ends reaching down to solid rock. The upstream cofferdam was built, most of the overburden removed, and plans to pour concrete were being made when an unseasonal rain turned the trickling stream into a wild, furious millrace. Most of the work washed out. Meteorologists called it an "unusual" storm. The superintendent, who speaks more fluently and is better understood in construction parlance, called it something quite different, but he set to work to rebuild the cofferdams so that the cut-off walls could be poured. The second time he made it.

The stream will flow through the flume intake of the concrete cut-off while the abutments are being excavated, the valley floor laid bare, and until the concrete in the dam reaches flume level. Then an access gallery of the dam will be used until the river can be diverted through the permanent outlet works.

A 24-inch perforated Armco corrugated pipe was placed vertically from bed rock at the time the cofferdam was built, and carried up to the top of the concrete wall on the upstream side. Surrounded by gravel, this pipe is now the source for all water supply. A 6-inch Byron Jackson pump, controlled by an automatic float, keeps a storage tank high up on the mountain side filled with pure, chlorinated water. This is the source of concrete mixing water, and is also used for drinking and other purposes.

In order to reach all parts of the dam with materials, it was necessary to erect a main cableway. The head tower, weighing 25 tons, is stationary and is located directly in front of the hoist house containing a 20-ton Lidgerwood hoist driven by a General Electric Type MT-410 induction motor operating off a 2,200-volt ac line. The tail tower provides for 600 feet of travel, which will permit the concrete and any other material to be placed anywhere on the dam. This tower is braced by a forward stiff-leg shoe riding on a narrow-gage railroad setting on a 45-degree slope. The main tower travels on standard-gage railroad track laid horizontally.

The cableway towers and the concrete for their pedestals and guy-bolt anchors were hauled up the mountain-side roads by two Caterpillar D-8 tractors. These tractors also brought up the structural steel for the Noble batch plant high on the right abutment. It was hoisted by a Lorain 40 Motocrane and then bolted.

The main cable for the cableway is a 3-inch lock coil piece manufactured by the American Chain & Cable Co. No special choice is made for the drop cables except that they must be preformed and of a size and construction adapted for later use on the cable-operated shovels.

Excavation

The main excavation consists of right and left-abutment key cuts extending 10 feet down into solid rock and across the

narrow valley from abutment to abutment. Work began at the top. Cuts were seldom deeper than 12 feet, making heavy blast-hole drills impractical. Lighter, more mobile rigs, capable of moving in and drilling a shallow section in a hurry, seemed to be more advisable. So the contractor brought in ten Ingersoll-Rand wagon drills and twenty Ingersoll-Rand 55-pound JB-5 Jackhammers.

When drilling began, it became apparent that a tough problem had to be solved. Bits were dulling faster than usual. Two smiths per shift were assigned to cover the blacksmith shop, which ran 24 hours a day. Two new Gardner-Denver sharpeners were purchased, and in a few days the output of the blacksmith shop settled down to a constant average of 350 sharpened bits every 8 hours. A flat rack truck used up a good part of its day hauling dulled bits into the shop and returning a load of sharpened ones to the drillers.

Hard though the drilling was, the wagon drills accounted for 100 feet of hole in 8 hours, and each JB-5 Jack-

hammer showed an average footage of 60 feet in the same period. The wagon drills used 2½-inch bits and 1½-inch bits were used on the JB-5's.

The holes were loaded with a pound of 40 per cent gelatin per cubic yard of rock to be moved, dividing the business among four powder companies. While this may seem a slightly excessive amount, it might be well to recall that the rock was hard to break. It had to be loaded heavily so that it would fracture sufficiently to place in dump trucks. The largest blast held slightly over 2 tons of dynamite.

The broken rock was loaded out by a 2-yard Lima diesel shovel on the right abutment and by a Koehring 801 machine working on the left side of the river. Both machines loaded into a single fleet of nine 6-yard GMC and International dump trucks equipped with Wood and Galion hoists. The material was wasted ahead of and below the dam, calling for relatively short hauls from the shovel. About 25 feet of keyway was

(Concluded on next page)



Road grading in Monroe County, Georgia, with a Bucyrus-Erie S-90 Scraper and TD-18 International TracTractor.

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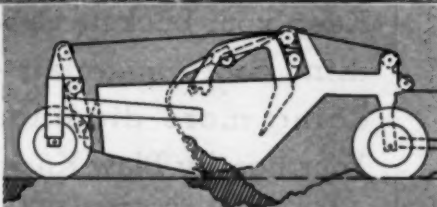
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ACCURATE CONTROL — Accurately controlled cutting edge picks up dirt from high spots and fills in the low spots.



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Concreting Plant for New Gravity-Type Dam

(Continued from preceding page)

generally excavated before the haul road had to be dropped to a new level. A Caterpillar D-8 and LeTourneau bulldozer kept the digging area near the shovels cleaned up. Every bit of loose rock was taken out of the keyway and the solid granite left so clean that it looked as if it had been sand-blasted. Drilling went on in one side of the cut while the shovel loaded out of the other side, and only the time required to move the shovel out during blasting was lost. Using this system, 700 cubic yards of rock was handled per 8-hour shift.

Concrete Work

The concrete for the dam will be placed by efficient, up-to-date methods, following a schedule already arranged by the superintendent. The aggregate processing plant was set up close to the dam on the right bank, so that a plentiful supply of wash water for the rock would be available.

The aggregate will be dug from a gravel pit 1½ miles away, using the two rock shovels which will have finished that phase of the work by the time concreting is ready to commence. The aggregate will be trucked to the gravel plant and dumped directly into a gravity feeder which will keep a 50-foot Good-year conveyor belt operating at capacity. The rock will drop into two revolving grading trommels, which separate the oversized boulders from the finer material. Boulders drop into an Allis-Chalmers crusher and are fed back through the trommels.

The plant conveyor system then routes the aggregate across a 4 x 14-foot Allis-Chalmers low-head vibrating screen driven by an Allis-Chalmers 50-hp electric motor, where it is washed, graded, and drops to a conveyor belt leading out to the respective stockpiles. Sand drops down to a Link-Belt drag scrubber, where it is washed before being stockpiled. The different stockpiles lie alongside each other and the aggregates are recovered through a timber tunnel.

As each size of aggregate is needed, it will be sent up to the Noble batch plant by a belt conveyor system which runs across the river valley and up the moun-



Drilling at the right abutment for the dam.

tain side. Six separate runs are used, with General Electric motors ranging from 15 to 100 hp, depending on the pitch of the conveyor run. The belt is carried across the river on bents of wood piling driven by the Lima machine rigged as a crane, using a portable set

of leads and a No. 2 Vulcan hammer.

At the batching plant, the material goes to the storage bins which serve the automatic weighing devices. The Noble plant includes two 4-cubic yard mixers, which dump into the cableway bucket. The aggregates to be produced and used

with Victor cement for the concrete are as follows:

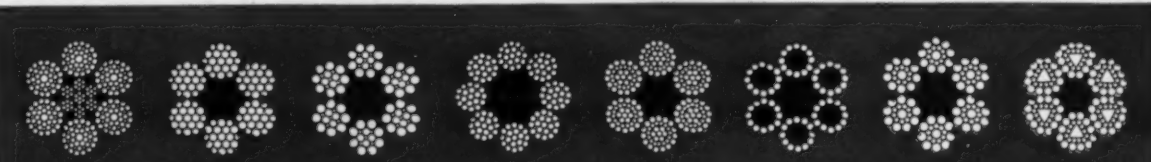
- No. 1—From 6 inches to 3 inches
- No. 2—From 3 inches to 1½ inches
- No. 3—From 1½ inches to ¾ inch
- No. 4—From ¾ inch to ¼ inch
- Sand—From ¼ inch to 1/200 inch.

Personnel

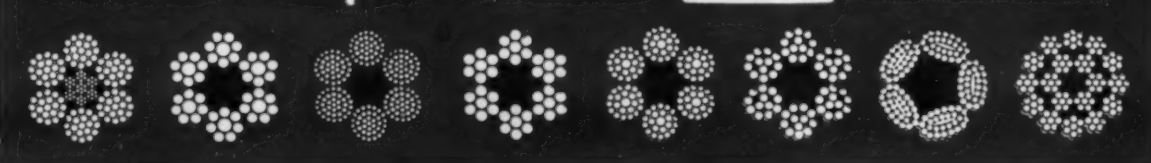
At the time this article was written, the contractor was well along with excavation, and since only 80 tons of steel reinforcement are called for in the big gravity-type dam, it appears as though the necessary priorities will be secured for the concrete work.

This \$2,000,000 218-foot concrete dam is being built by contract for a western municipality, to increase its water supply. In the interest of national security, the location and mention of personnel connected with construction vital to the war effort are omitted.

This war for freedom will be won only by the concerted effort of every individual in this country. One way we all can help is by the regular purchase of U. S. War Bonds.



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There is a wire rope for every application. Make sure you are using the proper rope on each installation. The wrong rope can be extremely wasteful of time, money and steel.

Some machines have sheaves which impose severe bending strains on the rope. On some machines the cable drags through abrasive stone, gravel or rock. Some ropes must endure the heat of handling ladles of molten metal, while others must run at excessively high speeds. For each job there is a one best rope, not only in construction but grade. Consult an American Cable engineer.

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The new Monarch Uni-Point radial saw known as the Streamliner.

New Streamlined Saw Has Safety Features

Designed to meet the national need for the utmost speed, efficiency and safety in production, the new Monarch radial saw, known as the Streamliner, just announced by the American Saw Mill Machinery Co., Hackettstown, N. J., has a number of new mechanical and safety features.

This new saw incorporates the Uni-Point principle, permitting the operator to make an instantaneous setting for any cross-cut angle, with the saw blade always cutting into the work at the same point in the table. This feature enables the operator to set the machine with speedy accuracy for any cut without raising or lowering the saw or making any other complicated adjustments.

Among the new mechanical features are an increase in the cross-cutting capacity; 32 roller bearings in the ram house to assure light-pressure precision travel of the saw, easy operation, and reduction of wear to a minimum; a spring bumper on the ram housing to cushion the back stroke and assist in starting the forward motion of the saw; and an adjustable crack feed bar which mechanically controls the saw travel for heavy dado work and other difficult cuts.

Of utmost importance are the safety features, which include a safety zone in the front of the machine and below the table where all adjustment and locking levers are located so that, when making adjustments, it is never necessary for the operator to reach over the machine. Also, the machine is provided with an adjustable guard having an effective anti kick-back device. Another safety feature is the telescoping ram which returns the saw behind the fence, leaving the table free and clear of all obstructions and eliminating the danger of the operator striking his head or shoulder against the ram.

Further information on the features of this new Streamliner radial saw and its many uses in the construction field may be secured by those interested direct from the manufacturer by mentioning this item.

Equipment Corp. Expands

The Equipment Corp. of America, 1150 So. Washtenaw Ave., Chicago, Ill., a national organization for rebuilding and marketing construction equipment, has recently undergone further expansion by the purchase of a 250-foot brick building adjacent to its present properties in Chicago. This addition was made necessary by the great demand for rebuilt construction equipment occasioned by the large government building program in connection with war industries. The newly acquired building will be used to house much of the rebuilt construction equipment and thus provide additional space in the main plant for rebuilding operations.

2,130,480-Yard Pour Completed at Friant

Without any celebration or ceremony, the final cubic yard of concrete was poured in Friant Dam on Tuesday, June 16, 1942, completing a total of 2,130,480 cubic yards of concrete placed in the dam. The first bucket of concrete was placed in the east-abutment section of the dam on July 29, 1940. Since that time a new California record for one month's concrete work was set when, during August, 1941, Griffith Co. & Bent Co., general contractors for the dam, poured 228,769 cubic yards of concrete into the structure. This monthly record stands today although the record daily pour, twice raised at Friant Dam, has since been exceeded at Shasta Dam.

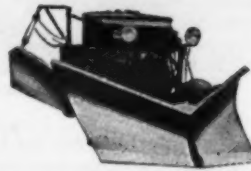
The pouring of the final yard of concrete in the dam does not by any means indicate the completion of Friant. Work will continue for some weeks on the installation and painting of metal work, backfill and clean-up operations. The drilling of grout holes in the foundation

of the dam will continue for several months and grouting of the holes by Bureau of Reclamation forces will also be continued.

Friant Dam, the fourth largest concrete structure in the world, is on the San Joaquin River about 20 miles from Fresno, Calif. It is a straight gravity dam, with an overflow spillway in the center, four river outlets, four outlets into the Friant-Kern Canal, and two into

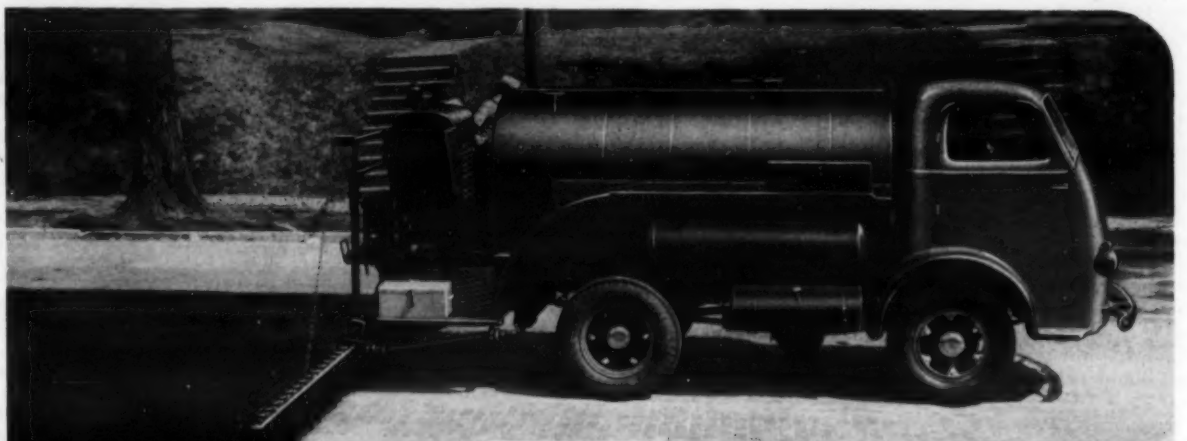
the Madera Canal. The dam is about 320 feet high, 3,430 feet long at the crest, and 265 feet wide at the base. Millerton Lake created by the dam has a capacity of 520,000 acre-feet of water. The reservoir will be used as a cushion for floods originating in the upper reaches of the river and will provide storage for supplemental irrigation water which will be used in Madera, Fresno, Tulare, Kern and Kings counties.

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Let's work together on the important task of keeping your highways open next winter. Check over your repair requirements, then place your orders EARLY. We'll do the best we can for you. Priorities are required and higher priorities are demanded on some parts than on others. By acting promptly you may be able to avoid the cost and inconvenience of snow-blocked roads. Delay may mean disappointment.

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Water-Repellent Base In Service Two Years

The Paving Contractor Completed 47,000 Yards Of Resin Waterproofing At Naval Air Station

THE experimental work with resin on streets at a Naval Air Station passed its first anniversary with a clean record. A few patches were evident in the bituminous surface where there were base failures, but these are almost inevitable in low-cost operations. The 17,000 square yards of resin-waterproofed bases for streets and parking areas around the Bachelor Officers' Quarters are nearly two years old, while the 30,000 square yards of similar work around the new Cadet Officers' Quarters have recently passed the 12-month mark. Examination of these roads, which have handled a large volume of heavy construction traffic, showed them in truly A1 condition.

Character of Soil

The natural soil at the Naval Air Station is a poorly graded sugar sand, which made it necessary to haul in 6 inches of sand-clay for the base operation. Soil tests indicated that the required amount of Vinsol resin to be used was 1½ pounds per square yard; but actually 2 pounds per square yard, 6 inches thick, was used. The clay content of the sand-clay was high, and the resin was used to make the base water-repellent.

Preparing the Resin

The Vinsol-resin slurry, composed of 1,000 pounds of Vinsol resin with 15 pounds of caustic soda made up with water to 1,000 gallons, was prepared in a very convenient manner for application to the sand-clay material to waterproof it. A 1,000-gallon tank with a 15-inch manhole at the top was mounted on a truck and was equipped with a 2-inch centrifugal pump which, during the mixing operation, pumped the slurry out of a drainage pipe at the rear and back through a hose into the top manhole. During the application of the slurry to the road, this hose was connected to a distributor bar at the back of the truck, so that the Vinsol resin was applied to the road under pressure.

A loading platform was built at a central location, with the floor level with the top of the distributor truck. This enabled the laborers to pass the Vinsol bags easily to the men dumping them into the manhole. The platform was wide enough so that, after a loading, sufficient bags could be placed upright and opened to be ready for the next charge. A fire-hose connection with a swing pipe was used for putting water into the distributor tank before adding the Vinsol. Caustic soda, an essential chemical for producing the resin slurry, was added in the form of a 40 per cent flake from a bucket with a perforated bottom, which was suspended in the tank after it was about one-half full of water. No difficulty was experienced

in handling the caustic soda, as it was dipped from the 100-pound containers with a ladle and placed in the bucket. Even when it got on the hands of the men it caused no burns, as they kept their hands dry.

The slurry was applied to the base material at a uniform rate of ½ gallon per square yard, repeated four times to give the 2 pounds per square yard of 6-inch base required. Whenever the base was below the proper moisture content, water was applied and mixed into the base material with harrows and disks before the compaction was started.

Treatment with Resin

The treatment of the areas near the Cadet Officers' Barracks is typical of most of the work at the Station. The

surface of the sand-clay was scarified to a depth of 3 inches, and a strip 12 feet wide was pushed up into a windrow. The lower portion of the 6-inch layer of sand-clay was then treated with the resin and thoroughly disked. Then the windrowed material was pulled back over this treated soil and the resin applied in the top 3 inches. The entire 6 inches was then thoroughly disked and harrowed by a Killefer spring-tooth harrow, the section checked for moisture content, which was maintained close to the optimum, and then compacted by a double Euclid sheepsfoot roller pulled by a pneumatic-tired tractor. After the sheepsfoot roller had compacted all but about the top 1 to 1½ inches, the final compaction was done by a smooth-rubber-tired 9-wheel roller, working over the area at the same time as a motor patrol grader bladed the material, shaping it to the final cross section.

Variations in Work

The sand-clay base at the Bachelor Officers' Quarters was laid down with a

minimum depth of 4 inches, and was treated with 1½ pounds of Vinsol resin. Because of the thinness of the layer, the slurry was applied in one application on top of the pulverized soil and then worked by disks into the lower portion of the base. Inasmuch as this work was done under rather wet conditions, the Vinsol slurry was made more concentrated. In spite of considerable wet

(Concluded on page 32)

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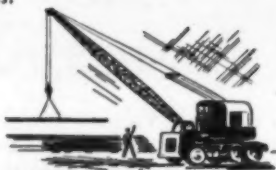
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to get every hour of extra
rope service we put in . . .**



Here are some helpful tips you can pass along . . . things that mean even longer life for Roebling "Blue Center" Steel Wire Rope . . . steel saved for U. S. at War!

Lesson One:—take a piece of string and pull it gently . . . you'll find it will stand an unusual strain before breaking. But snap the same string quickly and it's easily broken.

Same thing applies to a wire rope. In any kind of hoisting operation, it's vital that the rope should have no slack at the beginning of the lift—else the load might be applied suddenly and then the impact on the rope will be greatly in excess of weight of the load being handled. So *don't jerk your ropes.*



Lesson Two:—a hammer weighing only a few pounds can produce a blow having the force of a couple of tons. The load on a wire rope is like a hammer—striking a blow on the rope whenever you start the load too quickly. Even without slack, the

rope gets a tremendous impact when power is applied too fast—as in the case, for instance, when the operator of a shovel moving a boulder tries to knock it out of the way instead of easing it out.

And it's the same when the rope is going the other way. When even a light load is stopped suddenly while being lowered, the rope is subjected to a much greater strain than the equipment could ever apply to it in hoisting. So *don't jolt your loads.* Brakes should be applied smoothly and uniformly, and at the slightest sign of "grab" should be eased off. Brake your load over a longer period and your rope will last over a longer period.

In general, shock loads will remove from the rope the very elasticity that is put in to absorb normal impact, while careful handling will preserve the rope's elasticity and keep it in condition to deliver long life. Of course, the way a machine is run always affects its general maintenance. It's a well-known fact that some people are harder on machinery than others. An operator can push a machine (and a rope) just so far to get extra work out of it—beyond that, the punishment takes its toll of both the machine and the rope—and breakage begins to cost more than the extra work is worth. But in these days when rope steel is vital to the war effort, *wire rope must not be abused.*

Lesson Three:—a pitch-fork was not made to shovel sand. Likewise, "borrowing" ropes is very seldom practical. In these

times of priorities and shortages, some operators have been "borrowing" ropes from one operation and installing them on another.



Before you "borrow" a rope, make a careful analysis to see whether you won't get better ultimate economy out of putting the right new rope on the equipment that needs it, and taking the necessary steps to preserve the used rope and make it last on the job it's now doing.

Roebling "Blue Center" Steel Wire Rope is made to deliver a long lifetime of service—it has built a reputation for just that, wherever wire rope has a routine or unusual job to do.



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More ways to help you conserve wire rope coming in this space next month.



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Building New Levee On Flood-Control Job

(Continued from page 1)

of Tuckahoe, N. Y., on a 440,000-yard levee at Binghamton, N. Y., on Section 2 of the present Flood Protection Project being built by the U. S. Engineer Department, used shovels and trucks on two parts which it built and the subcontractor, Edward Acker Co., Inc., Chesapeake City, Md., used Carryall scrapers on 2,924 feet of levee with a maximum haul of 2,400 feet.

The levee is built with an 8-foot top or crown, with slopes $2\frac{1}{2}$ horizontal to 1 vertical on both sides. The specifications required the placing of the material in 6-inch layers with complete moisture control and the compaction of the material at optimum moisture content with sheepfoot rollers.

The Carryall Section

The subcontractor used five Le-Tourneau Carryall scrapers of 17-cubic yards capacity on the 2,924-foot Port Dickinson levee of approximately 100,000 cubic yards. The material was hauled from Borrow Pit No. 1 which gave a maximum haul of about 2,400 feet for the scrapers which were pulled by RD8 tractors. Excellent compaction was secured through the action of the tractor crawlers and the kneading of the large rubber tires of the scrapers, supplemented by the deep packing action of the sheepfoot rollers.

The Truck-Hauled Sections

For the Stow Park levee, which was 3,880 feet long, the 180,000 cubic yards of earth fill was secured in Borrow Pit No. 2 and was loaded by a $1\frac{3}{4}$ -yard Lima and a $1\frac{1}{4}$ -yard Osgood shovel to a fleet of eight to seventeen trucks. In Borrow Pit No. 3, a $1\frac{1}{2}$ -yard Lima and a $1\frac{3}{4}$ -yard Osgood were used to load to from eight to eighteen trucks a total of about 160,000 cubic yards for the section of levee along the Susquehanna River which was 4,450 feet long on the left bank and 2,000 feet on the right.

On these two latter levees, where the material was hauled by truck, an R5 gasoline-driven Caterpillar tractor with bulldozer, three RD6 tractors with bulldozers, three RD4's with bulldozers, an Allis-Chalmers Model L with bulldozer, two RD5's with LaPlant-Choate bulldozers, and an RD8 with bulldozer were used in addition to a TD-40 International tractor with Bucyrus-Erie bulldozer and a TD-14 International tractor with a Bucyrus-Erie bulldozer. For compaction, two Trojan sheepfoot rollers, three Euclid sheepfoot rollers and one LaPlant-Choate sheepfoot roller were used. Not all of this equipment was operated at any one time.

A total of 57 trucks of 10-cubic yards capacity were employed on the job, the average in use at any one time being about 32.

The Concrete Outfit

This section also involved considerable concrete flood-wall construction which is not featured particularly in this article devoted mainly to levee construc-

tion. The concrete outfit comprised a Lorain 40 $\frac{3}{4}$ -yard truck-mounted crane; a $1\frac{1}{2}$ -cubic yard Osgood shovel; four Rex truck mixers, later changed to three Jaeger truck mixers; two electric-driven vibrators; a Buffalo-Springfield steam roller which provided the steam for winter curing; and four pumps of 3 to 6-inch discharges.

Miscellaneous Equipment

An Erie steam crane was used to swing and provide the steam for the operation of a McKiernan-Terry No. 6 steam pile driver for driving the sheet piling cut-off of the cantilever wall. Miscellaneous truck equipment on the job included one International, Chevrolet and Plymouth pick-up trucks; a Brockway and a Ford stake-body truck; a Mack tractor with a Fruehauf trailer; two Mack trucks with 1,000-gallon water tanks; and a Ford truck for hauling diesel fuel, gasoline and oil.

Personnel

The contract for Section 2 of the

Binghamton, N. Y., Flood Protection Project was awarded to Tuckahoe Construction Co., Inc., at Tuckahoe, N. Y., on its bid of \$434,366.50. Throughout the work, Dominic and Joseph Luciano, members of the firm, were in charge for the contractor. The operation was carried on under the direction of the Binghamton, N. Y., District Office, U. S. Engineer Department, Lt.-Col. J. C. Marshall, District Engineer, with D. E. Mather as Resident Engineer.

New Scraper Tires Save Much Rubber

The fact that conservation of rubber is absolutely essential to the war effort is no longer news, but it is news when half a million pounds of rubber can be saved at one plant alone next year.

Working on a request from the U. S. Engineers, Denn M. Burgess, Vice President and General Manager, R. G. Le-Tourneau, Inc., Peoria, Ill., has devised a method of cutting down by 25 per cent

the crude-rubber content of the 18 x 24 tires used on LP Carryall scrapers. Proportionate savings will be made in the manufacture of 16 x 20, 10 x 20, and 8.25 x 20 tires used on the smaller Carryall models. These new tires will be made by Firestone and Goodyear.

It is reported that approximately 70 pounds of rubber will be saved on each 18 x 24 tire manufactured, 60 pounds from the casing, 7 pounds from the tube, and 3 pounds from the flap. This saving in rubber will not affect the load capacity of the tires but will cut the estimated working life of the tire from 30,000 to 20,000 hours. However, the latter represents about five years of service in the construction industry and ten years in the Army. The new tire will have a $\frac{1}{4}$ -inch tread.

This newly designed tire has been accepted by the War Production Board as standard equipment on all types and makes of heavy dirt-moving equipment. It is estimated that its use will save the industry as a whole about 1,500,000 pounds of rubber in the next year.

AMERICA'S ROADS MUST BE KEPT IN FIGHTING TRIM, TOO!



"Stitch-in-time" road work is especially economical and necessary today. A comprehensive program of maintenance and repair will keep your highways in fighting trim for the duration.

America's all-out Victory Program demands 100 per cent performance from every turret lathe and drill press turning out the munitions of war.

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Let the Tarvia® field man help you.

He can show you how a Tarvia maintenance and repair program can stretch your highway dollar to do more of the things required of it. Tarvia is a truly universal paving material—proved by nearly 40 years of service for road-building, maintenance or repair.

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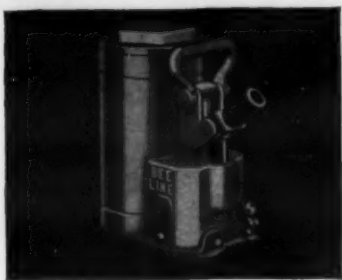
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The Bee Line 50-ton jack.

New Hydraulic Jack For Many Odd Jobs

A new 50-ton hydraulic jack designed particularly for jobs requiring a sturdy yet compact unit has recently been announced by the Bee Line Co., Davenport, Iowa. Special high-strength alloy material is used throughout in the construction of this jack to assure maximum efficiency and safety, it has a 50 per cent overload guarantee, and it weighs 74 pounds.

Among its features are a new patented principle of construction; large oil ports and passages, assuring a quick return of the ram and no air-bound troubles; simple construction with few parts; large pressure areas requiring less oil pressure per ton of lifting capacity; and an automatic take-up on all packing so that there is nothing to adjust or tighten in service.

Further information on the Bee Line hydraulic jack may be secured by interested contractors and state and county highway departments direct from the manufacturer by mentioning this item.

Certification Simplified

For Preference Ratings

By the terms of an amendment to Priorities Regulation No. 3, which became effective July 1, the use of preference ratings are simplified and standardized. Under this amendment, any preference rating, no matter how it was assigned, may be applied or extended by a single form of certification, which states merely that the purchaser certified to the seller and to the War Production Board that he is entitled to use the preference ratings indicated on his purchase order, in accordance with the terms of Priorities Regulation No. 3. Thus, existing orders which require a purchaser to furnish his supplier with copies of preference rating orders or other special certifications are all rescinded, except for the special provisions of Priorities Regulation No. 9 with respect to the application of preference ratings for certain types of exports.

In addition to the standard certification, orders on which a preference rating is applied or extended after July 1 must also include the identification symbols required by Priorities Regulation No. 10, which established the Allocation Classification System.

The amended Regulation No. 3 permits the extension of a preference rating to replace materials in inventory only to the extent necessary to restore the inven-

tory to a practicable working minimum. No rating higher than A-1-b may be assigned to orders for replacement of materials in inventory, even though the order for which the materials were used may have carried a higher rating.

Littleford Road Equipment Described in New Catalog

The complete line of Littleford black-top road construction and maintenance equipment is described and illustrated in the new Catalog R recently issued by Littleford Bros., Inc., 485 E. Pearl St., Cincinnati, Ohio. Copies of this catalog may be secured by interested contractors and state and county highway departments direct from the company.

Littleford equipment includes asphalt and tar kettles, spray attachments, tool heaters, surface heaters, utility spray tanks, pressure distributors, concrete heaters, tank-car heaters, portable rollers, road brooms, powder magazines, tool boxes, and bituminous-paving hand tools and accessories.

OUT IN FRONT FOR UNITED NATIONS



MORE MATERIALS will be hauled for 1942 war production in **STERLING WHEELBARROWS** than ever before in history. Sturdy old **STERLINGS** are being brought into service on vital war jobs... and all will perform with typical **STERLING** low-cost results. Perfect balance; easy wheeling; sturdy welded steel trays put **STERLING WHEELBARROWS** out in front, in terms of material-transport, to advance production for the **UNITED NATIONS**. **STERLINGS** simplify jobs today—as they have for the past 38 years.

STERLING WHEELBARROW CO., MILWAUKEE, WIS.

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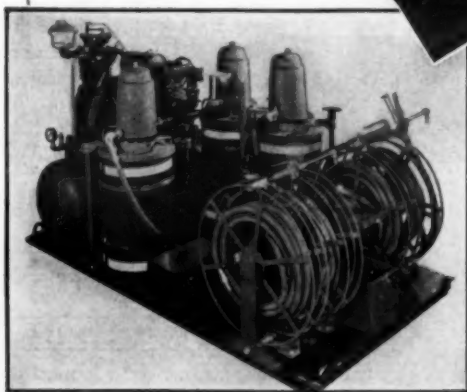
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STERLING Quality

Power Lubrication on the Job Saves Vital Hours on CONSTRUCTION FOR VICTORY!

- ✓ *Cuts Lubrication Time*
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*Pays For Itself
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The new Alemite Portable Service Station, which pumps direct from 100-lb. drums, is **crated as a unit**. Every piece of equipment is mounted on one platform, which can be transferred immediately to the platform of any ½-ton truck. It's ready to go to work saving money for you as soon as you get it!

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**Pumps Lubricant Direct from
100-lb. or 400-lb. Original Drums!**

NOW you can get Alemite Portable Service Stations adapted to suit the requirements of any size construction project. The large one pumps grease direct from 400-lb. drums. The small one pumps direct from 100-lb. drums. Both are highly efficient. They service your busy construction machines in a hurry—accurately, positively, dependably!

For lubricating pressure gun fittings, filling transmissions, or refilling crank cases, your Alemite Portable Service Station meets every need—in short order!

By cutting lubrication time—by avoiding breakdowns and making machines last longer because of regular, dependable lubrication—Alemite Portable Service Stations pay for themselves *in days*! This has happened not once, but repeatedly—where careful records have been kept on many projects! Mail the coupon today for your copy of our latest catalog!

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White Mfg. Co.

ELKHART

INDIANA

A Fine Gravel Used For Nebraska Paving

Dobson & Robinson Paved 7.6 Miles of Highway 2; Well-Planned Batching Set-Up Featured Job

(Photos on page 52)

† THE paving of 16.4 miles of State Highway 2 between Seward and Lincoln, Nebraska, last summer, is a boon to traffic approaching the state capital from the northwest. Prior to the completion of this work, heavy traffic on U. S. 6 coming from the southwest merged with traffic on U. S. 34 about 17 miles west of Lincoln, overloading an old roadway. With the completion of the new 20-foot 9-7-9-inch reinforced-concrete pavement on Highway 2, the Federal Route, U. S. 34, runs over the state route, making a more interesting and safer entry to the city and permitting traffic to by-pass Lincoln to the north if desired.

The contract for the 16.4 miles was awarded to Dobson & Robinson, and Abel Construction Co., contractors of Lincoln, Neb., jointly, the Abel Construction Co. building the 8.8 miles at the eastern end and Dobson & Robinson, the 7.6 miles on the western end. The bid for 88,849 square yards on the western end was \$186,582.90. The only difference in the two sections was that Dobson & Robinson used three types of expansion joint material, cork, pre-moulded non-extruding felt joint, and a joint consisting of an assembly of non-extruding bituminous fiber and sponge-rubber ribs, and the other section had the Nebraska standard pre-moulded non-extruding felt joint.

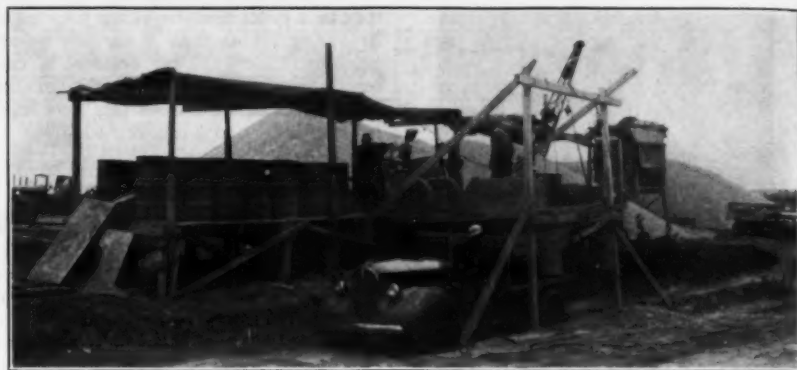
Long-Distance Water Supply

Water for the Dobson & Robinson concrete-paving job was secured from the City of Seward at a hydrant on the east edge of the city, where a Sparling meter was inserted in the 4-inch line. From that, the contractor laid 0.8 mile of line with Dresser couplings to a large stock tank. At this point three triplex pumps were installed, a Jaeger and a Gorman-Rupp which were used regularly, and a Worthington for a stand-by. These pumps maintained a pressure of

200 pounds on the 3-inch pipe line laid along the shoulder on the north side of the road for a distance of 7 miles to the job, and a maximum of 10 miles to the extreme end of the job, including the initial 0.8 mile.

Batching Gravel and Cement

The gravel was hauled in by truck from a railroad siding 4 miles distant to maintain large stockpiles from which a Link-Belt crane with a Blaw-Knox clamshell bucket was used to fill the bins of the Blaw-Knox batching plant. After the start of the job a pit was excavated and after the stockpiles had reached their maximum required size, the trucks dumped regularly into this pit, which was lined with planks, making an easier grab for the clamshell.



C. & E. M. Photo

The dock for rehandling and dumping the Stevens Batch Barrels for cement.

The cement was hauled 4 miles from a railroad siding where a crew of six men in the cement cars loaded the Stevens Batch Barrels and wheeled them on the three trucks which hauled twelve barrels each to the batching dock adjacent to the aggregate batcher. Here the weights of cement were checked on

Fairbanks scales and the barrels wheeled with the standard two-wheel rigs over a two-hole trap. The trap was counter-balanced, being built with a wood top and an enclosed area of old belting, so that the weight of the man operating the trap lowered it over the two-batch truck

(Continued on page 42)



ALL MICHIGAN SHOVEL-CRANES are quickly convertible to any standard front-end attachment

MICHIGAN Mobile SHOVELS-CRANES

— for FASTER Construction

Owners are setting records on new construction, on maintenance work, in industrial plants and on scattered operations with the MICHIGAN Mobile SHOVEL-CRANE. Fingertip Air-Controlled clutches enable operators to maintain fast pace production without let downs due to operator fatigue. Maximum stability is provided by the low gravity center and low unit ground pressures of Model TMCT-16 (½ yd. Dual Tandem Drive). This complete MICHIGAN unit, mounted on its own specially designed MICHIGAN chassis, is fully described in Bulletin C72. Write for your copy.

The smaller MICHIGAN Model T6-D (¾ yd. Single Axle Drive) is noted for its great productive capacity over a wide range of operations. This single-engined truck-type excavator-crane has its own specially designed and constructed chassis. Like the larger TMCT-16, Model T6-D's great stability is an outstanding feature, as are the Fingertip Air-Controlled clutches. Model T6-D is praised by owners for its low maintenance costs, flexible operation and high output. Bulletin C72-1 tells why. Your request brings full data by return mail.

SPECIFICATIONS Models TMCT-16 and T6-D

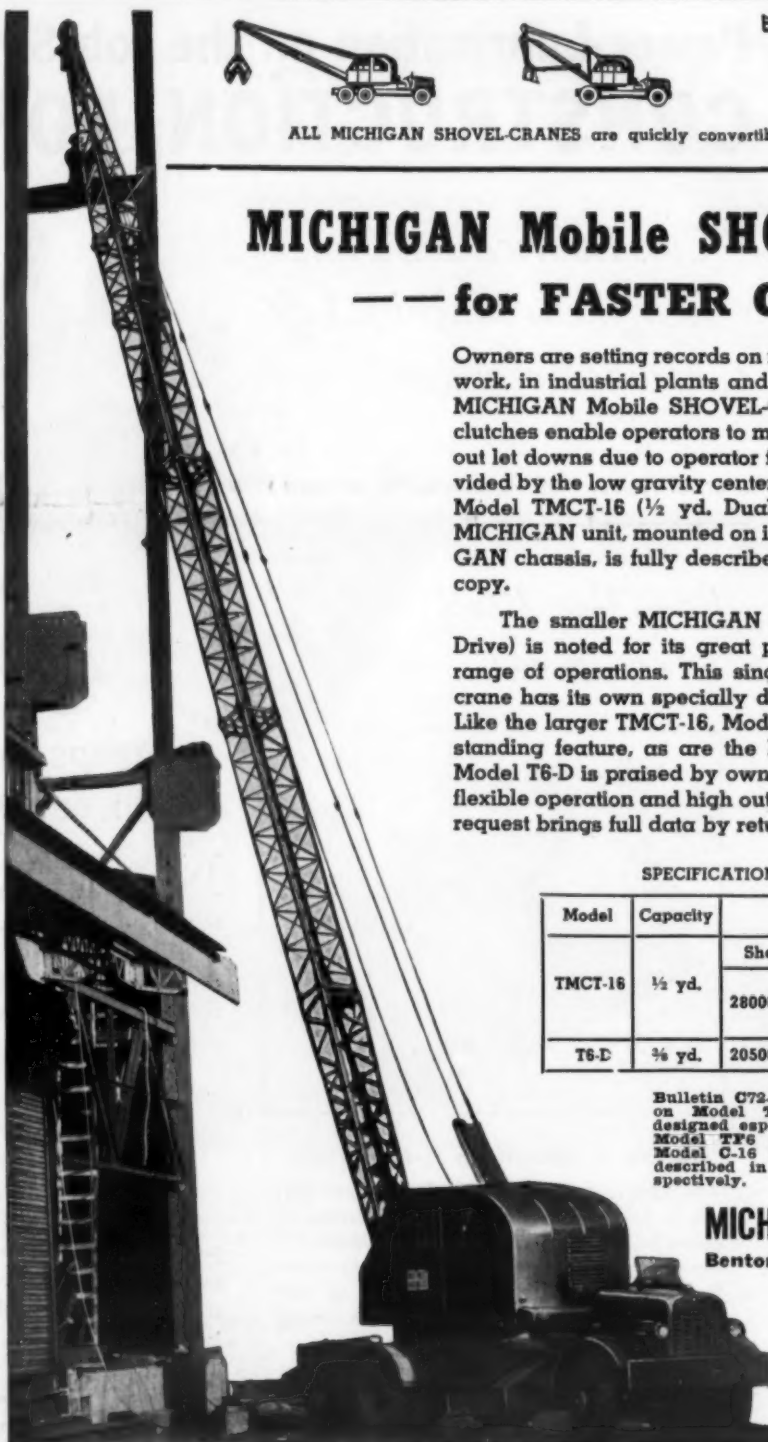
Model	Capacity	Weights		Tail Swing	Gross Allowable weight
		Shovel	Crane		
TMCT-16	½ yd.	28000 lbs.	26000 lbs. to 28000 lbs.	7'-3"	35000 lbs.
T6-D	¾ yd.	20500 lbs.	19000 lbs.	5'-6"	26300 lbs.

Bulletin C72-2 contains detailed specifications on Model TMCT-16 (Dual Tandem Drive) designed especially for high-speed crane work. Model T6-D (¾ yd. Four-Wheel Drive) and Model C-16 (½ yd. crawler) are completely described in Bulletins C72-3 and C72-4, respectively.

MICHIGAN POWER SHOVEL CO.

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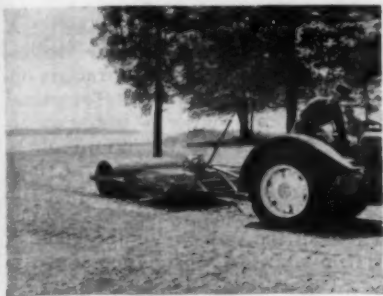
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—WITH GEARED STEP-UP
OR V-BELT DRIVE—CARRY-
ING HANDLES OR WHEEL-
BARROW FRAME.

Marvel Equipment Manufacturers, Inc.
224 So. Michigan Ave. Chicago, Ill.



A Tractortiller digging sprigs of Bermuda grass for planting between runways at an airport.

Sprigs for Airport Produced by Machine

One acre of Bermuda grass sod was quickly converted into sprigs for transplanting on 15 acres at an airport recently. Since dust is a serious hazard at airports, where planes are continually landing and taking off, sod planting is frequently resorted to as a means of establishing grass areas between the runways as quickly as possible. The planting of grass sprigs accomplishes this purpose almost as quickly and much more economically.

On the particular airport referred to, the production of the sprigs was done in an unusual manner. Usually the job would require several tractors and other equipment, as well as 40 to 50 men to dig the sod and cut it up for sprig planting. Instead, a Tractortiller, made by Ariens Co., Brillion, Wis., was run over the Bermuda grass sod in place, digging up the sprigs, shaking out the dirt completely, and disintegrating the sod into small pieces of roots so that they could be transplanted easily. The swirling, chopping action of the tines in the Tractortiller accomplished this work with one trip over each strip of sod.

Complete information regarding the work of the Tractortiller in mixing stabilized bases and in soil-cement work, as well as in the production of grass sprigs from sod, will be furnished promptly by the manufacturer to those referring to this item by title.

Engineers Study Project On American River, Calif.

Engineers of the Bureau of Reclamation have started exploratory drilling of the foundation of the Folsom Dam site on the American River in California, it has been announced by Commissioner John C. Page. The site is being tested in connection with irrigation, power, and flood-control studies of the proposed American River Project. These studies, begun in 1939, have developed the possibility of an advantageous connection with the Central Valley Project which might indefinitely defer the need for the Delta Cross Channel.

Construction of the Central Valley Project is well advanced at Shasta, Keswick and Friant Dams and on some of the canals, but construction has not yet been undertaken on the proposed Cross Channel which is designed to divert water from the Sacramento River to the San Joaquin River near Stockton.

The American River Project originally was proposed in 1931 as a part of California's long-range State Water

Plan. Since the war, it has been advanced as a source of more electric power for California industries. The project would include large storage dams and hydro-electric plants on both the north and south forks of the American River, and a third storage dam at the Folsom site on the main river.

The recent investigations indicating the feasibility of constructing a gravity canal south from Folsom reservoir to a balancing reservoir near Ione and from there to the intake of the Delta-Mendota Canal at some point on the San Joaquin River south of Stockton in no way reflect on the engineering feasibility of the Delta Cross Channel, which would undoubtedly be required eventually in any case. The high-line canal might be built at less cost, but both plans will be given careful study.

The work under way is authorized under the general investigations program of the Bureau of Reclamation but no authorization yet exists for Federal construction of the American River Project.

Don't Hoard!

(Continued from page 4)

remainder of 1942. Snow-plow blades for next winter are in the same class. Share them with nearby counties or states whose finances did not permit purchases ahead, and who buy only as the need arises for blades and other materials.

Stocks of materials, such as copper wire and steel cable, were gathered perhaps too assiduously by some Federal departments but were distributed, in most cases, to projects whose progress was slowed down by lack of these very materials. Except for a few instances of Army and Navy stocks of materials deemed absolutely necessary as a backlog for insured continued prosecution of the war at high speed, there are practically no instances of the hoarding of construction materials on projects today. Priorities have taken care of that.

Hoarding through carelessness is today one of the greatest evils to be com-

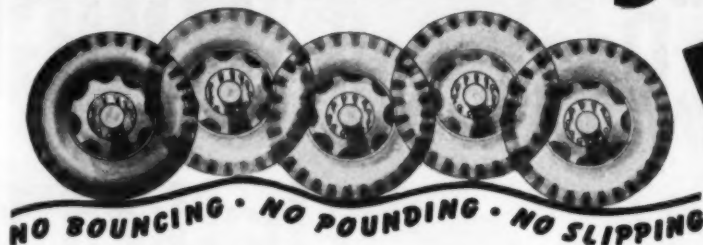
bated in our industry. Return wire and cable reels promptly; don't hang on to gas cylinders or oil and grease drums. Return them promptly. Careless hoarders aid the enemy! Don't work for Hitler!

Your Dollars Are Never Too Old to Go to War! Enlist Them Regularly. Buy War Bonds and Stamps.



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Because there is very little unsprung weight in a Walter Truck, tires cling to the ground surface, following the contour of depressions and bumps without losing contact. For this reason, tires run cooler and with less wear and tear. This is a vital consideration to all heavy duty truck operators during the present tire shortage.

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HEET-MASTER Kettles for

AEROIL BURNER CO., INC.

5775 Park Avenue, West New York, N. J.

Chicago San Francisco Dallas

Plant-Mixed Road Base For Minnesota Highway

(Continued from page 2)

The maximum liquid limit of the fraction passing the 40-mesh sieve was 30. The Plasticity Index of the fraction passing the 40-mesh sieve was required to be between 3 and 12.

The Pioneer crushing and screening plant delivered the crushed and screened material to a chute and thence onto a 25-foot horizontal belt driven by an International power unit. Midway across this belt the clay was delivered from a conveyor at right angles, the speed of the gravel belt being six times the speed of the clay belt which was also driven by an International power unit. This ratio does not mean that one sixth of the total material was clay as it was delivered in a smaller volume per minute to the belt as well as the belt traveling more slowly. The 25-foot horizontal belt delivered the gravel, sand and the added clay to a bucket elevator which raised the material to the storage bins at the top of the Madsen asphalt plant which was used for mixing the stabilized base and later as an asphalt plant for mixing the bituminous top. The material, which was fairly well mixed and with no segregation as delivered to the bins, was weighed out in 2,250-pound batches into the pugmill, from 3 to 4 per cent of water added, and the whole mixed for one-half minute. A Caterpillar D13000 was installed to operate the bucket elevator and pugmill of the mixing plant. The water for mixing was taken from the water mains of the city of Detroit Lakes. This mixing plant shut down but 2 hours in six operating days of 22½ hours each. The only difficulty experienced was some wearing of the chain, which had been expected. A replacement chain had been on order for some time, but had been delayed through the usual cause of present delays in the delivery of construction equipment and parts.

Placing the Base on the Road

A fleet of from five to ten trucks was used to haul the mixed material from the Madsen plant to the road. The trucks operated three shifts a day as follows: 6:30 a.m. to 2 p.m.; 2:30 p.m. to 10 p.m.; and 10:30 p.m. to 6 a.m. They windrowed the material for a 2-inch layer down the center of the road day and night, placing bomb torches at the end of the windrow and along the edge of the road to warn night traffic. The blades used for spreading the material worked only from 4 a.m. to 8 p.m. in two shifts, the object being to mix and lay the material at once during the daytime so there would be practically no loss of moisture, and to windrow the material at night when the loss of moisture would be at a minimum.

Two tank trucks, one of 1,200-gallon capacity and one of 1,400-gallon capacity, both Internationals, were used to spray water on the mix as it was being spread so that the final moisture content would be about 10 per cent. The tanks were supplied with water by two



C. & E. M. Photo

A Pioneer conveyor and screen comprising part of the processing unit for clay on the Megarry Bros. plant-mix stabilized-base contract at Detroit Lakes in Minnesota.

Rex self-priming centrifugal pumps located at creeks or water holes along the job.

The windrows were spread by a No.

12 and a No. 11 Caterpillar power grader, the full 36-foot width for the bottom layer, coming in to 32 feet wide for the third or top layer of the stabil-

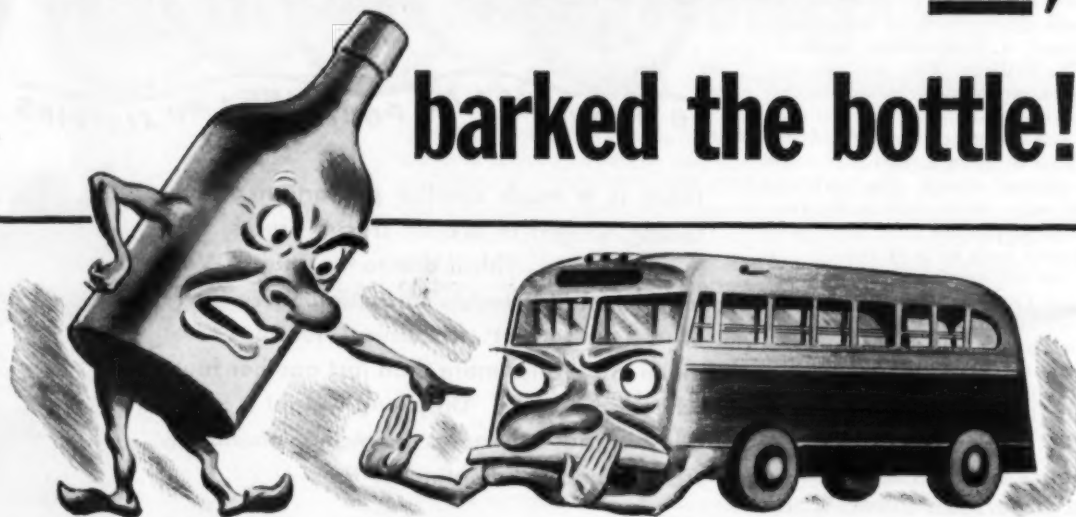
ized base.

Immediately behind the power graders two Bros pneumatic-tire rollers pulled by International F12 tractors operating on pneumatic tires compacted the material. In order to insure an accurate adherence to the crown of 1/3 inch per 12 inches on the road, both power graders were equipped with Slope-Meters which gave an accurate picture of the position of the blade at all times. One of the operators reported that there were times when he, who is considered an expert grader man, thought that the blade was sloping in the wrong direction, but when the Slope-Meter showed it to be different he relied on that and the engineer's levels inevitably proved the meter to be right.

This comparatively small amount of equipment on the road produced a 2-inch layer of mixed stabilized base on 8,000 linear feet of road in a 22½-hour day. Densities up to 145 pounds per cubic foot were recorded in four to five

(Concluded on next page)

"Don't talk **TOUGH** to me,
barked the bottle!"



"I CLAIM I've got the toughest job in the world for Diesels! At the F. E. Reed Glass Co., manufacturers of all types of glass containers, in Rochester, N. Y., we have 5 Ingersoll-Rand Diesels, and boy do they work! 24 hours a day—seven days a week—at peak capacity! And do you know something? Since we discovered a certain oil, in 14 months we haven't had a stuck ring or valve. In 50,000 hours of operation we haven't had anything but perfect lubrication! Top that, my friend."

"OKAY, BOTTLE! Down in West Virginia where I hail from, the Pittsburgh-Weirton Bus people travel their buses over mountainous country. Toughest going you ever saw. They've covered more than 500,000 miles of it, too! And since we discovered *our* secret we've been able to more than double the time between oil changes. Rolling 21 hours a day, in low gear almost all the way, our engines are cleaner than ever, bearings in topnotch condition, rings free!"

BOTTLE: "Sounds almost unbelievable, Brother Bus! I don't see how you can do it—unless you use the same oil *we* do... RPM DELO."

BUS: "I do, Brer Bottle! Indeed, my boss wouldn't think of using anything else *but* RPM DELO. Fact is, I can't see why anybody should use anything else."

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Ask your Diesel engine manufacturer or distributor for the RPM DELO supplier in your vicinity.



STANDARD OIL COMPANY OF CALIFORNIA

Placing Oil-Mix Top On Stabilized Base

(Continued from preceding page)

days with the stabilized material as laid. An interesting commentary on the workability of the material occurred when a windrow of stabilized material was left on the road during a heavy rainstorm. The base layer had already been laid and when the windrow was spread the lower layer was found to be softened beneath the windrow and broke under traffic. It was promptly scarified 2 inches deep and then bladed and rolled and came out as solid as any other part of the base.

The Oil-Mix Top

As soon as the stabilized base was completed, the contractor moved the Pioneer crushing and screening plant some additional 40 feet away from the Madsen asphalt plant and installed a 30-foot long x 6-foot-diameter oil-fired drier between the crushing plant and the asphalt mixing plant.

The road was prepared for the oil-mixture by a thorough cleaning of loose material from the surface with a Hough rotary broom without a blower. The surface was then primed 27 feet wide in three 9-foot strips, using a 1,200-gallon Rosco distributor with full-circulating spray bars. Traffic was kept off a strip after the prime had been applied for about 2 hours but this did not hold up traffic as only one strip was applied at any time in one section. The prime consisted of 0.2 gallon per square yard of MC-O cut-back asphalt.

If the road was unusually dirty when it came time to lay down the oil mixture it was swept, but this usually occurred only at the edges where material was tracked in by vehicles coming from side roads. The operation of placing the oil-mix surface material was similar to the placing of the stabilized base, as the asphalt plant operated 16 hours a day, the material was windrowed down the center of the road and the blades worked from 4:00 a.m. to 8:00 p.m. in two shifts.

The bituminous surfacing consisted of a mixture of SC-4 road oil and gravel and was delivered to the road in windrows at about 175 degrees. Before spreading the oil mixture, a light tack coat of 0.05 gallon of SC-4 road oil per square yard was applied to the primed base for the purpose of blotting up any dust and providing additional bond between the oil-mix top and the base.

Spreading was then completed by the two Caterpillar power graders. During



C. & E. M. Photo

Metering the processed clay which was delivered by belt to the gravel belt at right angles to the clay belt and shown traveling to the left at six times the speed of the clay belt.

the process of spreading and immediately after completion, the surface was given an initial rolling by a pneumatic-tire roller. It was necessary to delay

final rolling by the 6-ton Huber steel roller until sufficient heat had left the mix. However, material laid in the afternoon was always rolled before dark

by the 3-wheel steel roller.

The bituminous mixture contained from 4 to 4.2 per cent SC-4 road oil and was laid at the rate of 104 pounds per square yard. This produced a compacted mat 1 inch in thickness. The width of the completed mat was 26 feet.

Personnel

The contract for the construction of Project 0303-17, consisting of 11.2 miles of bituminous surface on a stabilized base on Minnesota 34 east of Detroit Lakes, Minn., was awarded to Megarry Bros. of St. Cloud, Minn., on the bid of \$69,263. For the contractor James Hill was Superintendent. Ollie Bluhm was Plant Foreman and W. A. Maus was Road Foreman. George Russell was Resident Engineer for the Minnesota Highway Department.

Never have the proper care and maintenance of equipment been so vital as they are today, to keep machines working at top efficiency and to conserve critical materials.



Step No. 1

The Whiteman Rodding Machine—operated by one man, keeps up with any method of concrete delivery, simultaneously levels and condenses the pour with its power operated screeds.



Step No. 2

Floating the slab is a quick, simple job for one man with the Whiteman Finisher equipped with "Heavi-Duti" Trowels.



Step No. 3

Finishing is fast, surfaces are harder when you use a Whiteman Finisher—with CRUCIBLE STEEL Finishing Trowels.

MACHINES Finish Better Concrete—FASTER!

The Whiteman 3-Step Method—

Here's the way to lay your concrete faster—indoors or outside. Put Whiteman Machines on your job—multiply the capacity of your men—get better concrete surfaces in less time, at lower cost!

Only two types of Whiteman Machines are needed!

Each step of concrete slab work is speeded by Whiteman Machines.

1. SCREEDING—One operator with the Whiteman Rodding Machine can simultaneously level and condense 4 cu. yd. of low slump concrete in 5 minutes. The power operated screeds, pulled forward by the operator produce denser concrete faster than any hand screed crew.

2. FLOATING—Put the Whiteman Precision Finishing Machine with "Heavi-Duti" FLOAT TROWELS on the job. Here, again, one man gets better results, FASTER! With the weighted, power-rotated, flat trowels, one operator compacts the mix, easily covers 1,000 sq. ft. in 15 minutes.

3. FINISHING—When ready to finish the slab, change trowels on the Whiteman Finisher and use the CRUCIBLE STEEL "FINISHING" TROWELS. Again the motor operated (gasoline or electric powered) machine does better work in less time. Your crews can do MORE than TWICE AS MUCH WORK as by hand. If you have a concrete laying job to do in a hurry—call on Whiteman—probably we can help you as we have scores of others.

"DANGER ABOVE!" —Avoid it with



Simplex Trench Braces

Simplex Drop-Forged Trench Braces give longer service, easier adjustability and a greater safety margin on all trench wall, pit and sewer bracing. They are the trench braces made with drop-forged ball-and-socket and lever nut. Unbreakable—stronger and more durable than malleable.

For greater safety, lever nuts are blunt—no injuries to workmen or damage to clothing. For close quarter use a Simplex 3-way unbreakable nut can be furnished with three holes to fit 1" round lever bar.

Ball and socket joints permit quick adjustment at any angle. Lugs insure firm grip on planks or plywood. Proper length pipe adapts braces to any width of trench.

For wide, deep trenches or foundation or subway jobs, use Simplex Drop-Forged Timber Braces which have trench brace screw ends.

Templeton, Kenly & Co.
Chicago, Ill.

Better, Safer Construction Braces Since 1899

Simplex Jacks

A better Jack for every job—many jobs for every Jack



WPB Order Curtails Construction Unless Vital to War Effort

In a move to make all possible material and effort available for immediate war production, officials of the War Production Board and the War and Navy Departments have established broad principles governing all wartime construction which will bring such work under more rigid conservation control.

This program means that no new plants will be built unless they are absolutely essential and can meet seven newly established criteria. This applies not only to direct war plants but to all other construction, both publicly and privately financed.

One of the main reasons for the new policy is that all critical materials are needed for war production now, and no materials can be spared for building new facilities except when they are absolutely necessary. The policy means simply that, in the light of existing shortages, it is necessary to put materials and effort into planes, ships, tanks and guns now, rather than putting them into plants which would not produce fighting weapons until a much later date.

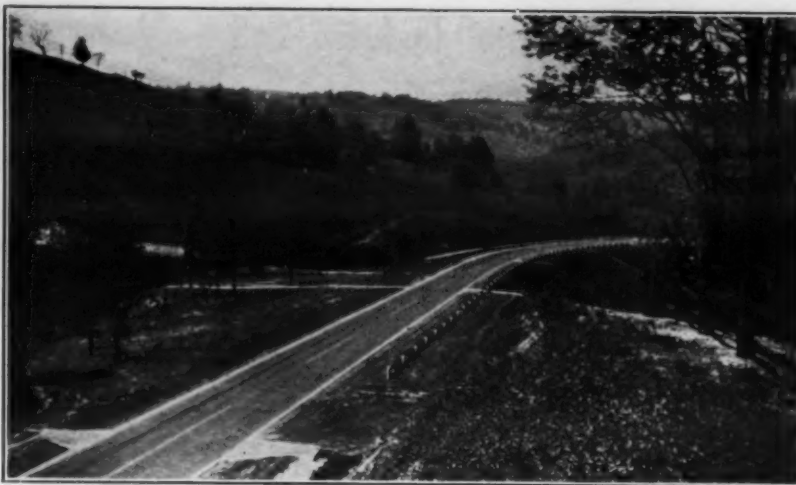
These principles were outlined in a directive, effective immediately, signed by Donald M. Nelson, Chairman of the War Production Board; William H. Harrison, Director of Production; Henry L. Stimson, Secretary of War; and Frank Knox, Secretary of the Navy.

The seven criteria which must be met before any project will be approved for construction are:

1. It is essential to the war effort.
2. Postponement of construction would be detrimental to the war effort.
3. It is not practical to rent or convert existing facilities for the purpose.
4. The construction will not result in duplication or unnecessary expansion of existing plants or facilities now under construction or about to be constructed.
5. All possible economies have been made in the project, resulting in deletion of all non-essential items and parts.
6. The projects have been designed of the simplest type, just sufficient to meet the minimum requirements.
7. Sufficient labor, public utilities, transportation, raw materials, equipment and similar factors are available to build and operate the plant, and the manufactured product can be used at once or stored until needed.

Most Important Job On 1942 Roadsides

The most vitally important single function of the entire highway roadside program in 1942 is the control of erosion or run-off on newly graded roadway areas outside the limits of the pavement edges. In discussing this problem, Robert C. Ranney, Landscape Architect, Division 2, Ohio Department of High-



An erosion-control project on U. S. 40 in eastern Ohio, showing effective growth six months after the work was completed by L. F. Ilgenfritz, contractor, of Monroe, Michigan.

ways, reported that during 1941 about 550 miles of roadway area on state highways throughout Ohio were pro-

tected from erosion by seeding, sodding, vine planting and mulching treatment. Mr. Ranney stated, "I do know from

experience that a well controlled area, when the control treatment is applied immediately after construction, saves one operation by the contractor, namely, that of the last fine grading or 'sand-papery' of shoulders, slopes and ditches. Instead of performing this rather costly, and at best but temporary, finishing operation, a seed bed is quickly prepared and the seeding operations follow immediately. After completion of the contract work the only money that need be spent on such areas is for a small amount of adjustments to straw and levelling of ruts on shoulders until a good covering of turf has been established, and finally the regular seasonal mowing operations.

"On the other hand, where similar areas have been left unseeded for two or three years following construction, hundreds or even thousands of cubic yards of additional dirt have been required per mile to bring some of these areas back to a satisfactory cross-section before it was practicable to proceed with erosion control operations."

BATCH-CYCLE SPEED

CUTS POURING TIME

THESE 3 OPERATIONS
REDUCE BATCH-CYCLE TIME...



Wide, Flow-Line, Quick Charging Skip Saves Seconds.



Air Controlled Discharge Chute is Positive, Quick Acting.



Twin-Door, Large Opening Bucket Dumps and Spreads at High Speed.



HEAVY-DUTY CONSTRUCTION EQUIPMENT

MAXIMUM YARDAGE KEEPS JOB MOVING

Concrete slab jobs, today... airports, military highways and access roads... must be poured at top speed... men, equipment and materials... all striving to one end... smooth concrete highways and runways... in the shortest possible time. Koehring Paver batch-cycle speed helps meet production schedules. Batch-cycle is controlled by three important operations... charging, discharge and spreading. Koehring skip charges drum at high speed... drum interior quickly shrinks material... twin-door bucket spreads concrete without clogging delay. All operations are accurately and automatically batch-meter timed for maximum production.

KOEHRING COMPANY, Milwaukee, Wis.

WON'T QUIT or cause time out



A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

The Hayward Company
32-36 Dry Street
New York, N.Y.

Hayward Buckets

\$110,000,000 Voted For Access-Road Work

Congress has recently passed an amendment to the Defense Highway Act of 1941 authorizing an additional \$110,000,000 for access roads.

In addition to authorizing new funds, the amendment changes existing law by making such appropriations available for maintenance as well as construction costs. At the same time, \$10,000,000 is earmarked for access roads to sources of raw materials.

An expediting clause provides that the Commissioner of Public Roads is authorized to enter into contracts not exceeding total authorizations which, according to the PRA, will substantially speed up the access-road program by

eliminating the lag between authorization and appropriation of funds.

Heretofore, the certification of access roads to defense industry sites and sources of raw materials was vested in the Secretary of War or the Secretary of the Navy. Now, under the amendment, certification for access roads to sources of raw materials and industrial sites may be made by the Chairman of the War Production Board.

Don't Drive on Flats; It Will Ruin Tires

Every one of us is a part of the American public, and whether you are driving your own automobile on the job, or hiring a man to drive your truck, it is

your responsibility to protect the now truly valuable tires on your motor vehicles. In these days of no new tires, the casing becomes almost priceless and if an automobile or truck is driven even 100 feet when a tire goes flat, the casing may be damaged beyond repair.

Make it a practice yourself, and require it of your truck drivers, that they stop at once, making the chances good for saving the tire by repair and keeping the truck or automobile operating. If you drive while the tire is flat, the cords and fabric will rupture, no repair will be possible, and one good tire is finished.

Another point: don't take the tire off and drive on the rim. Engineers point out that such a practice may bend or scar the rim badly; it may even crack or dent the brake drum. Repairing or replacing

these parts in wartime is difficult, might be impossible, and this, too, might result in putting the vehicle completely out of service.

Cletrac Branch Mgr. Dies

W. G. Hannam, known to his friends and business associates as "Cap," and for many years with the Northwest Branch of the Cleveland Tractor Co., died recently at La Center, Wash., after a four-week illness. Born in England and educated in Europe, Mr. Hannam came to the United States in 1906; served in the United States Army in World War I; and joined the Cletrac organization in 1919, where he has most recently served as Northwest Sales Manager.

YOU CAN
Handle all kinds of jobs



Runway construction—huge military airport.

with a BUCKEYE SPREADER!

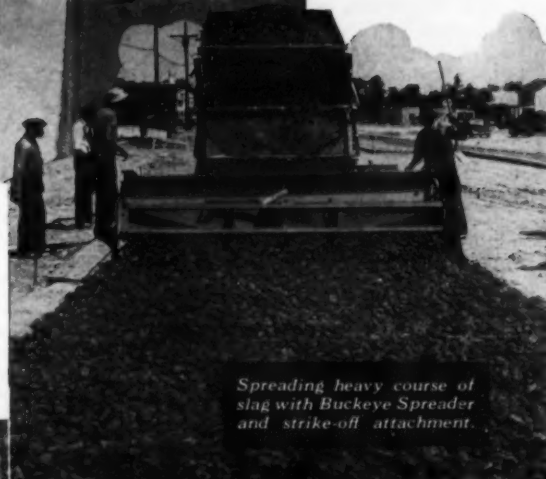
ACCURACY plus versatility makes the Buckeye Spreader an ideal machine for maintenance and construction of roads, streets and runways. This machine will handle everything from a fine sprinkle of sand up to a heavy course of rock, and with a strike-off attachment will put down courses up to six inches deep.

Transmission-driven feed roll is synchronized with truck speed and operates forward or reverse. Wheels are well in from end of box to permit spreading close to shoulders or obstruction. Spiral distributor, available when desired, feeds even wet or slightly tacky material to ends of box. Flow stops without dribble by manual control, or automatically when truck stops. These and other construction features that provide as high as 98-99% accuracy described in Buckeye Spreader Bulletin. Write for your copy.

BUCKEYE TRACTION DITCHER COMPANY, Findlay, Ohio



Street work in Minneapolis.



Spreading heavy course of slag with Buckeye Spreader and strike-off attachment.



Soil stabilization job—mixed material led from paver into Spreader.

Built by **Buckeye**

Convertible Shovels



Trenchers



Tractor Equipment



R-3 Finegraders



Road Wideners



Spreaders





C. & E. M. Photo
Falsework still in place for the cantilever cap of a pier for a standard South Dakota concrete bridge on U. S. 77.

Concrete Bridges Are Standardized

South Dakota Highway Dept. Has Simplified Design and Produces an Economical and Attractive Structure

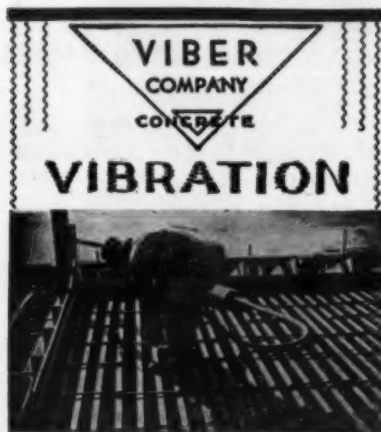
(Photos on page 52)

† BRIDGE design can be deadly when standardized plans are used, or the design can be simple and attractive and still maintain architectural interest. South Dakota has achieved this with a design which is economical to construct, is sparing in its use of concrete by substituting sills for elaborate abutments, and is distinctively attractive in its simplicity.

A typical structure of this type was completed last season by Bonesteel & Hyde of Wagner and Watertown, S. D., on FAP 193B (2), south of Clear Lake on U. S. 77 in Deuel County. This structure, 206 feet in length, does have some distinctiveness of its own as it is on a 6.5 per cent grade at the north end and is the bottom chord of a vertical curve. It replaces an old 60-foot concrete structure with its neat concrete and I-beam construction. It has three 68-foot spans and carries a 30-foot roadway with no sidewalk. It is in a ravine with the bottom of the beams 32 feet 4½ inches above the flow line of Hidewood Creek.

Excavation and Footing

The excavation for the footings was



MOST PROFITABLE FOR REINFORCED CONCRETE BUILDING CONSTRUCTION

When the job calls for mass vibration—the Viber Vibrator at work above is your best bet. Especially made for walls over 10 inches thick, foundations, large girders, thick floor slabs, columns . . . large reinforced concrete bridges, grade separations, concrete floor systems, concrete arches and rigid frame structures . . . In a word, for all concrete with large aggregate and low water-cement ratio.

Write for complete VIBER data TODAY!

VIBER COMPANY
726 So. Flower
BURBANK, CALIF.

in clay and a bouldery gravel and was carried 5 feet below the flow line of the creek. The work was handled by a Lorain 40 and a ½-yard clamshell bucket. The excavation was maintained dry by one Jaeger 3-inch and a Jaeger 4-inch pump.

The piers consist of two columns, each with a separate footing, having 16 untreated piles per footing, while there are 18 under each abutment sill. The Lorain 40 crane handled the leads for a 3,000-pound drop hammer which drove the piles to 30-foot penetration, the driving being very tight. The piles were cut off at the proper elevation to allow 12 inches of the piles to be encased in the concrete footings. The pier column footings were each 10 x 10 feet and 3 feet high. The form lumber consisted of 1 x 12-inch planks, with 2 x 4 studs, and 2 x 6 single wales.

Piers, Caps and Forms

The pier columns measure 3 feet x 3 feet 4 inches at the base and 3 feet x 3 feet 1 inch at the top, with a batter of

¾-inch per foot. The caps are 3 feet 4 inches deep between the columns and taper to 1 foot 9 inches deep at 6 feet 9 inches from the outside of the column. They are uniformly 3 feet thick and both are 33 feet 2 inches long. All of the concrete work was heavily reinforced.

The column forms were lined with ¼-inch plywood backed by 1 x 12 form lumber with 2 x 6 studs and 2 x 6 double wales. Universal form clamps with

¾-inch rod ties were used. The pier column forms were used twice, but the bottom forms for the cantilevered cap could be used but once as it was required that they be left in place for 21 days with adequate falsework as shown in the accompanying illustration.

Concreting

The actual pouring of the two columns . . .
(Concluded on page 39)

How to get the highest contraction joint performance at the lowest cost:—

SPECIFY

KEYLODE
CONTRACTION JOINTS

Easily Aligned
Designed for Speed
Work with Any Machinery
Hold their Alignment

WRITE FOR DESCRIPTIVE CIRCULAR



HIGHWAY
Steel Products Co.
CHICAGO HEIGHTS
ILLINOIS

LATEST DEVELOPMENT IN STANDARD OIL'S FLEET CONSERVATION SERVICE

NEW HEAT-PROOFED STANOLUBE H.D.

Beats heat—Cuts wear—Cleans engines

Timely motor oil discovery adds life to heavy-duty gasoline and Diesel engines

• It's NOT just another motor oil—it's a brand new, heat-fighting oil—"heat-proofed" Stanolube H.D. It's heat-proofed to stand up longer and to protect better against the more intense heat generated in modern engines.

Today's internal combustion engines are far more reliable and efficient than the engines of 10 or even 5 years ago. But their higher compression pressures, closer fitting, faster moving parts build up heat. At some points reached by the oil, temperatures have increased 50° to 100° in the last few years. These modern engines must be protected by modern oil able to work in the searing heat that saps the protecting quality of ordinarily good oils.

Standard's research men tackled this problem. It took hundreds of experiments and tests—but they whipped it thoroughly with the new "heat-proofed" Stanolube H.D.

Carbon—varnish—engine deposits—responsible for a large part of your maintenance expense and short equipment life—practically disappear when you use the new Stanolube H.D.

War-time requirements restrict the output of Stanolube H.D. But because of the vital need for conserving equipment, it has been made available to fleet operators. Take advantage of this opportunity to get help on the biggest job you have today—to make equipment last for the duration.

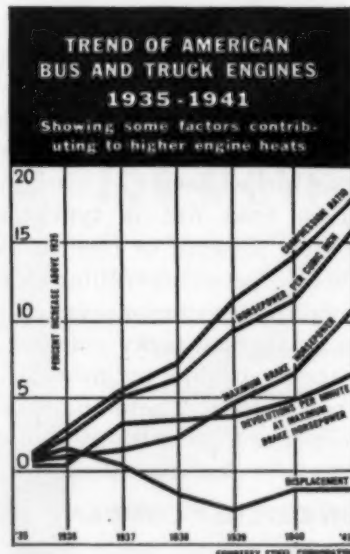
25,000,000 MILES OF PROOF!

Laboratory experiments indicated that Stanolube H.D. was an outstanding development in motor oil. But that wasn't

enough evidence. It had to prove itself in service.

Standard Engineers started looking for trouble—fleets that were hard to lubricate—fleets with varnish problems—sludge conditions—short piston and valve life.

To date, Stanolube H.D. has operated



more than 25,000,000 miles on the toughest lubricating jobs that could be found. And every mile has given added proof that Stanolube H.D. Beats Heat . . . Cuts Wear . . . Cleans Engines.

OIL IS AMMUNITION . . . USE IT WISELY

TYPICAL SERVICE TESTS:

A WISCONSIN BUS COMPANY had trouble with varnish formation. Valves were being reconditioned at 15,000 and pistons at 30,000 miles. A test bus operated 27,000 miles before valves were ground and 57,000 miles on one set of pistons with Stanolube H.D.

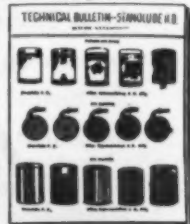
TWO DIESEL-POWERED TRUCK TRACTORS at a Minnesota freight line were put on Stanolube H.D. The engines were taken down at 130,000 miles to examine the needle bearings on wrist pins. Condition of the pistons, valves, and cylinders indicated that these engines could have operated for a much longer period without any trouble.

A MINNESOTA TRUCKING COMPANY started two new gasoline-powered truck tractors on Stanolube H.D. One has operated 90,000 miles, the other 70,000 miles. No mechanical work has been needed on either engine. Bearings have been inspected but none replaced.

There's 25,000,000 miles of evidence like this that Stanolube H.D. is the oil you need.

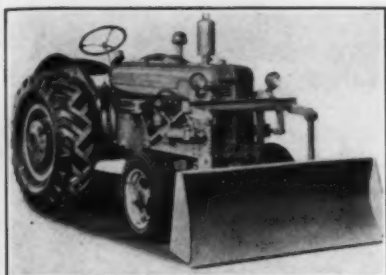
ASK TO SEE THIS BULLETIN

Ask a Standard Automotive Engineer to show you his Engineering Bulletin describing tests made on Stanolube H.D. and illustrating the startling results obtained using this new product. Write Standard Oil Company (Indiana), Rm 1223, 910 S. Michigan Avenue, Chicago, Illinois, for the Engineer nearest you. In Nebraska, write Standard Oil Company of Nebraska at Omaha.



STANDARD OIL COMPANY (INDIANA)
AUTOMOTIVE ENGINEERING SERVICE

LOWERS
MILEAGE
COSTS



A Baker Model 282 "baby" bulldozer on an International I-4 tractor.

New Bulldozer Finds Wide Variety of Jobs

The "baby" in the Baker bulldozer family was developed by the Baker Mfg. Co., 585 Stanford Ave., Springfield, Ill., for use on light wheel tractors, and today is being used extensively for finishing and clean-up work around Army camps and airports. An hydraulic unit, this bulldozer does the same type of work as the standard Baker bulldozer, leveling, grading, backfilling, spreading, excavating, and snow-handling, but on a smaller scale.

The Model 282 shown in the illustration is for use with an International I-4 wheel tractor, and is hydraulically controlled, being powered by a Baker rear power take-off hydraulic pump unit. The blade, which makes a cut 6 inches deep, is lifted and lowered by dual cylinders. The moldboard is 24 inches wide x 66 inches long and can be raised 12½ inches.

Because of the speed, flexibility, and size, this bulldozer unit can be used in tunnels and other confined quarters, for conveyor feeding, for clean-up, for the usual bulldozer service on small jobs, and as an auxiliary unit on large jobs.

Bulletin No. 835, giving complete details on the Model 282 bulldozer, may be secured direct from the manufacturer or from this magazine.

Pencil Line Tracing Reproduces Readily

The exodus of draftsmen from the offices of highway departments, as well as of manufacturers, has made it imperative that the amount of drafting-room operations be reduced to a minimum and be speeded as much as possible. Tuned to this wartime necessity, The Frederick Post Co., Box 803, Chicago, Ill., has developed Penciltex, a tracing cloth which it is claimed enables draftsmen with a pencil to turn out more work in a given time than heretofore. A pencil mark or line on the new No. 124 Penciltex is dense because the processed surface of this tracing cloth takes the pencil line readily. The cloth is tough and durable and is said not to discolor with age. The back of the cloth is glossy and it is remarkably transparent.

Because of this high degree of transparency and the texture, a hard pencil gives an ink-like reproduction on positive or blue prints. The manufacturer calls attention to the fact that Penciltex is an anti-smudge tracing cloth which permits the use of a 5H or harder pencil and produces the same dark, dense line as a 2H or 3H on ordinary tracing cloth, yet erasures are made quickly

with art gum or a soft eraser and they do not show on the blue print. Penciltex is available in 20-yard rolls in widths of 30, 36 or 42 inches or in sheet sizes cut to fit drafting room needs.

Protective Helmets

Tuff-Nut Hard-Boiled hats for workers in quarries, tunnels, dams and on similar jobs where the hazard of falling objects exists are described in a folder issued by the E. D. Bullard Co., 275 Eighth St., San Francisco, Calif. Features of these hats are their light weight, self-shaping, non-absorbent sweatband with a ventilation space all around the head, broad hammock straps, and a secure chin strap. The head protection is built into the crown which will dent under a heavy blow but will not break.

Copies of this folder with further information on Tuff-Nut safety hats may be secured by those interested direct from the manufacturer by referring to this item, or from this magazine.

When you Specify
SCHRAMM
Compressors

Without sacrificing an ounce of pressure or a day of hard-hitting useful life Schramm gives you a compressor with a weight saving up to 40%—a compact arrangement that releases critical materials so badly needed in our present crisis.

Send for Catalog 42-P

SCHRAMM, INC. WEST CHESTER, PA.
DEALERS IN PRINCIPAL CITIES

No. 1 SOURCE OF AMERICA'S MIGHT-IRON ORE

from Mahoning-Hull-Rust open pit at Hibbing, Minn.

• This largest of open pit iron mines is 2 miles long, ¼ mile wide and 250 ft. deep. The ore taken from this mine is more than all the earth moved in building the Panama Canal.



WELDED DIPPERS

IN 1941 approximately 8,000,000 tons, of the total 20,000,000 tons of ore removed from this pit, was dug with PMCO Welded Dippers. More PMCO dippers are constantly being used here because their unusual strength stands the strain of continuous operation and because their welded construction permits a saving in dipper weight that adds as much as 30% to the payload capacity of the shovel.

• Investigate the possibilities of increasing the payload capacity of your shovel with a PMCO Welded Dipper.

We operate the largest and most complete manganese steel foundry in the United States

PETTIBONE MULLIKEN CORPORATION

4710 West Division Street, Chicago, Illinois

THOMPSON CONSTRUCTION MATERIALS & EQUIPMENT

***** CONCRETE CURING MATERIALS *****

- Hunt Process
- Rilecure
- Cotton and Fibre Mats
- Salt Hay
- Paper

EXPANSION JOINTS

- Bituminous-Fibre
- Asphalt
- Cork
- Wood
- Rubber Latex

Write for complete literature and prices

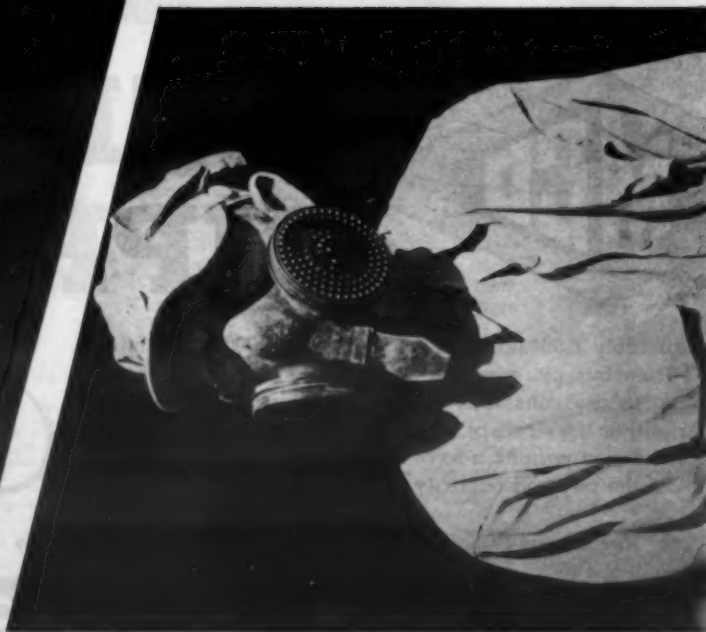
THOMPSON MATERIALS CORP.

Sales Office
204 West St., N. Y.

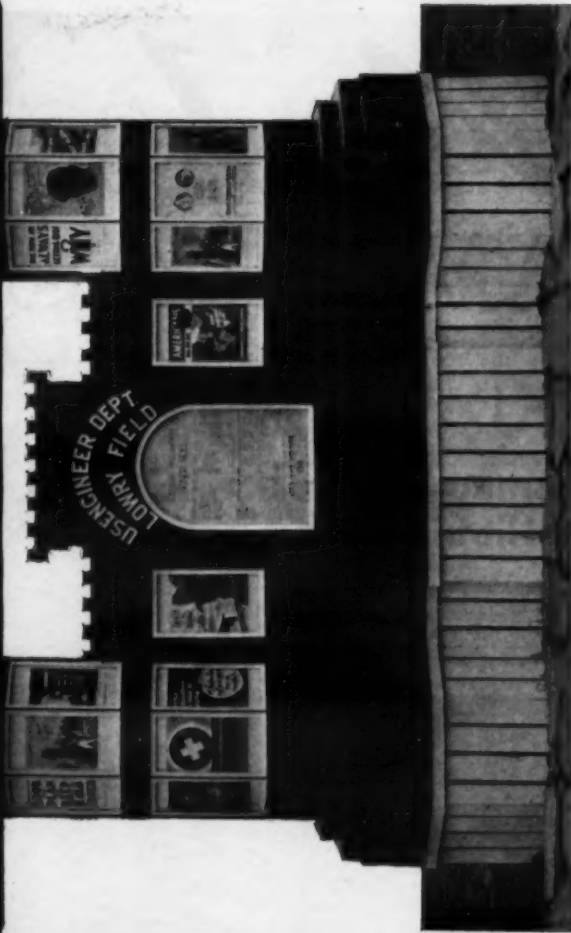
General Office
303 Cortlandt St., Belleville, N. J.

Reduce Construction Accidents

Safety Saves Men and Time
Essential to Our War Effort



DUST. Whether it be rock dust or cement, workers should be protected from inhaling the injurious particles by an approved dust mask or respirator such as is worn by this worker at the bulk-cement depot at Shasta Dam.



ADVERTISING SAFETY. Well-planned safety campaigns always include the display of carefully chosen posters which carry the safety message. These may be displayed singly and changed frequently, or in interesting groups, as at Lowry Field by the U. S. Engineer Department. We suggest you post this Safety Display on your bulletin board.



ROPES play an important role in saving lives. These men, stripping a slope for the abutment of a huge dam where there was danger of a cave-in, were protected from a possible drop of 40 feet by safety ropes.



Working in the tunnel, the sign for the air lock is a necessary precaution for air working personnel. Note the sign over the door of the air lock in this Chicago tunnel.

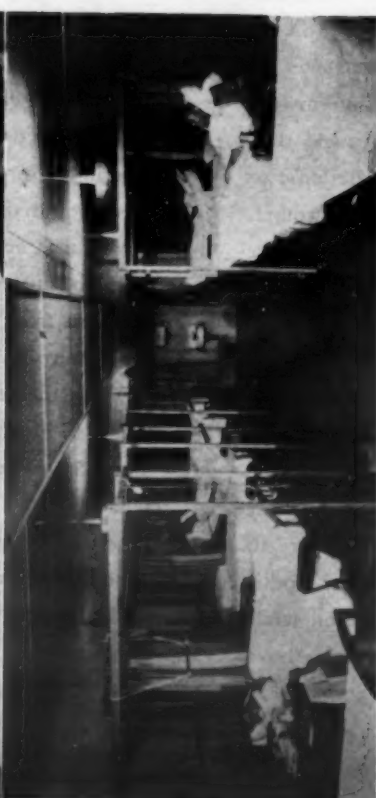


LOOSE TALK

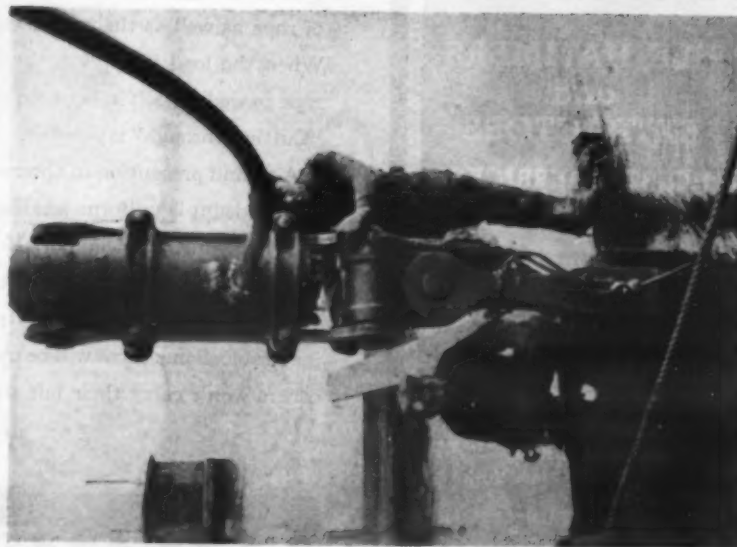


Wear your eye protection and passersby should be protected by screening the operation.

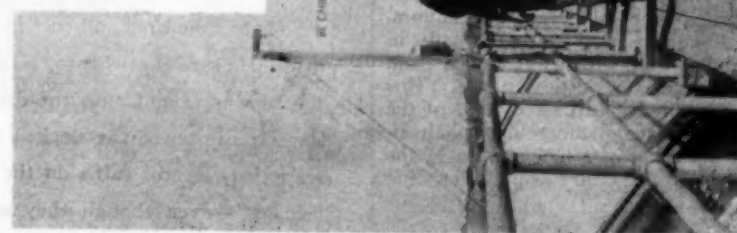
These are the only two places where the "no smoking" sign is placed over the door of the air lock in this Chicago tunnel.



CLINICS are an essential on all large construction projects to provide immediate care in case of accidents. These views of the clinic at Shasta Dam are typical of projects remote from regular hospital facilities. Top, the emergency room equipped to handle six patients at a time; and bottom, the 12-bed convalescent ward.



WATER HAZARD. On jobs involving work on, over or around water, all workmen should be equipped with life-preserver belts.



WALKS should be substantially built and without obstructions and uneven spots to trip workmen. Repeated warning signs keep workers safety-conscious.

Photographs reproduced in this poster were furnished by the National Safety Council, Bureau of Reclamation, U. S. Engineer Department, Liberty Mutual Insurance Co. and Contractors and Engineers Monthly.

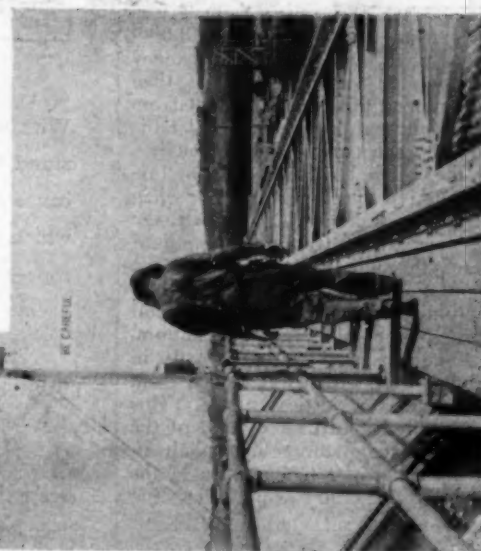
LOOSE TALK CAN COST LIVES



CRANKS. In instances where machines are not equipped with self-starters, this method of starting the motor puts the man entirely out of range of the crank.



FIRST AID. This all-steel fully-equipped first-aid station is also used as a shelter during blasting at a quarry. Well-equipped field stations should be installed on every construction job.



WALKS should be substantially built and without obstructions and uneven spots to trip workmen. Repeated warning signs keep workers safety-conscious.

Photographs reproduced in this poster were furnished by the National Safety Council, Bureau of Reclamation, U. S. Engineer Department, Liberty Mutual Insurance Co. and Contractors and Engineers Monthly.



STAIRWAYS. Mud and grease may make even a well-built stairway slippery, causing an accident. Expanded metal lath makes a good non-slip tread.



CLEAN DRINKS. This sanitary "water bucket" provides clean water, individual drinking cups and the very important salt tablets.

BARRICADES provide essential protection for workers as well as passing traffic and pedestrians. Top photo, a workman climbs out of a trench un-protected by a barrier. Instant on safe footing, he steps directly in front of a moving vehicle. Bottom, the job is now well barricaded to protect the workers and traffic.



glare. Nearby workers and passersby should be protected by screening the operation.

Preparing Hot Mix At Southern Airport

(Continued from page 1)

The gravel came in by rail to a point 4 miles from the plant. The material was generally a 1-inch to pea-gravel material. The coarse sand came from the same source as the gravel, and was from 1/4-inch down. The pea gravel was similarly handled. The material was stockpiled adjacent to the hot-mix plant, and rehandled and loaded by a P & H crane with a 1-yard Williams clamshell bucket.

The Standard Oil Co. of Louisiana asphalt was delivered in tank cars to the same point as the gravel. The 4-mile haul was made by a 2,000-gallon tank truck which was unloaded as described later in the handling of asphalt at the plant.

The Hot-Mix Plant

In order to maintain the proper relations between the fine and coarse sand delivered to the hot-mix plant, the crane loaded two clamshells of fine sand to one of coarse sand. This material was delivered to the square hopper over the reciprocating feeder, which delivered the material to a sheet-metal divider which sent equal portions to the twin-bucket elevators feeding the two 18-foot x 48-inch diameter driers, each equipped with two Littleford torches for heating them. Each drier was equipped with a separate blower to pull the vapors from the drier and speed the thorough drying of the aggregates. The two driers delivered the hot aggregates to one enclosed hot elevator, which raised them to the 20-ton hot bin equipped with a rotary screen which separated the material into gravel, pea gravel and sand.

The 85-100 penetration asphalt was trucked from the siding to the 18,000-gallon asphalt storage tank. A Kinney steam-operated asphalt pump then either pumped the material direct from the truck through a pipe laid under the asphalt storage tank and up through a Y to the weigh box with a waste line into the top of the storage tank, or when no truck was delivering asphalt the pump took direct from the bottom of the tank through the same line by the manipulation of two valves. The large asphalt storage tank had a 16-pipe coil of 2-inch pipe laid along the bottom, and three concentric circular coils in the center well, which was baffled from the two ends by vertical plates. This set-up assured a full circulation of the asphalt, adequate storage of asphalt almost at the proper temperature in the two end sections, and a quick boosting



C. & E. M. Photo

The hot-mix plant which produced material for the runways at a southern airport.

of the temperature in the center well just ahead of pumping.

The hot aggregate was weighed in the batch box by means of a Howe dial scales, and the aggregate weigh box was

equipped with a sloping bottom for fast delivery to the pugmill. One man handled the weighing of aggregates, and the mixer man handled the weighing of

(Concluded on next page)

New Pencil Designed for Multiple Carbon Copies

Today, when multiple records are so important, it is of interest to know that there is available a type of pencil especially designed for making multiple carbon copies. According to the manufacturer, the Reliance Pencil Corp., Mount Vernon, N. Y., the problem has always been that a pencil hard enough to make an impression through five or six carbons would cut through the top copy or make a light and hardly legible original; while pencils with soft lead are not strong enough to withstand the pressure necessary to make an impression on all copies.

This new pencil is called No. 700 DuroLead Multiple Carbon Copy and is the only black-graphite pencil especially created for manifold carbon copying. It is easy to erase and does not smudge, and is available in three grades, medium, firm and hard, through stationery dealers and some manifolding companies and salesbook manufacturers.

When attaching wire rope to a drum...

START IT RIGHT

Wire rope is tremendously strong and tough. It can stand terrific abuse without failure. However, just because wire rope "can take it," don't expose it to abuses which can be easily avoided. Get the most out of your rope—for yourself—for your country.

One simple way to insure longer service from wire rope is to take time and care in starting it right on the drum. Be sure that there is a brake on the reel so that the rope is wound onto the drum under uniform tension. If the tension is slacked off suddenly, and then reapplied, several turns on the drum will be loose or "slushy"—even though they may be evenly wound. These "slushy" turns won't support successive layers of rope as well as their more tightly wound neighbors. When the load is applied, there is a tendency for the rope to wedge itself in between the loosely-wound turns. "Cutting-through" is possible.

A second precaution to observe in spooling a new rope onto a drum is uniform winding. Each turn should lie snugly against its neighbor. If spaces or gaps are left between turns, succeeding layers of rope are sure to "cut through." Wedging and pinching of the rope is inevitable. Some turns will be under great tension, while others won't carry their fair share of the load. Above

all, avoid cross-overs—turns of rope which get out of position and cut across other turns in the same layer. Guide the rope onto the drum with a wooden bar or other handy instrument which will not abrade the rope. If this is done the first several times the rope is spooled, it will tend to spool smoothly by itself thereafter.

Always start a right-lay rope at the right flange of the drum when the rope *overwinds* on the drum, and to the left flange when the rope *underwinds* (this based upon facing the drum with the rope paying off toward you and in the direction of the load). By following this practice, you reduce abrasion of the rope between adjoining turns, and help to insure a snug uniform winding job. To find out the lay of your rope, hold it up vertically in front of you. The strands in a right-lay rope move upward from left to right across the rope as shown in the accompanying illustration.

Finally, to insure the smoothest spooling, use Form-Set Wire Rope. This rope is pre-formed, free from locked-up constructional tensions. Experience in a wide range of applications has proved that Form-Set spools smoothly, handles easily, and tends to speed up production.



Right-lay rope

PILE HAMMERS and EXTRACTORS HOISTS-DERRICKS WHIRLERS

Special Equipment
Movable Bridge Machinery

Write for descriptive catalogs.

McKIERNAN-TERRY CORP.
19 Park Row, New York

Distributors in Principal Cities

BETHLEHEM STEEL COMPANY



Laying Binder and Top For Airport Runways

(Continued from preceding page)

the asphalt, which was checked by Howe beam scales. The material was mixed 30 seconds after all aggregate and asphalt had been delivered to the pugmill, and required about 15 seconds for loading and 15 seconds for charging, giving a 1-minute cycle. The batches were mixed in 1-ton units, and 5 batches were delivered to each truck in the 4-truck fleet for hauling to the runways for spreading. The plant had a capacity of 50 tons per hour.

Auxiliary equipment included two vertical hand-fired coal boilers to furnish the steam for the plant, and a 9,000-gallon fuel-oil tank, to which the fuel oil was delivered from the delivery truck by one of a pair of Worthington reciprocating pumps. One pump was sufficient to furnish the required pressure for the oil at the Littleford burners.

Spreading the Mix

The hot-mix binder course was spread on the primed base in 10-foot lanes by a Barber-Greene tamping-spreading-finisher. When the second lane and succeeding lanes were spread, the joint was painted with 85-100 penetration asphalt to insure a full bond. Immediately following the spreading, the binder course was rolled to complete compaction and smoothness by 8 to 11-ton Galion tandem rollers operated as 8-ton units.

The operating crew employed at the spreader consisted of the operator, one man on the hopper, one screed man in back, three laborers sweeping and luting, and one raker.

Placing the Top

A blended asphaltic limestone-sand mixture, consisting of two parts asphaltic limestone and one part sand, with a total asphalt content of 6 per cent, was used as a 1-inch compacted finish or surface course on the binder. This was mixed and spread in the same manner as the binder course and compacted to a uniform seal of 1 inch by the 8-ton tandem rollers.

Analyses of Materials

The average screen analysis of the gravel, pea gravel, fine sand and coarse sand, as sampled in the stockpiles by representatives of a commercial testing laboratory, who were employed at the site, are given in the accompanying table at the top of the page.

The specifications for the binder-course mix were as follows:

Passing 1½-inch and retained on ¾-inch sieve.....10-25
Passing ¾-inch and retained on ¼-inch sieve.....25-40
(These two fractions combined could range between 35 and 55 per cent.)
Passing ¼-inch and retained on No. 10 sieve.....10-20
Passing No. 10 sieve.....25-35

The batches at the hot-mix plant were
Asphalt (Soluble in CS₂).....4.0-8.0

AVERAGE SCREEN ANALYSIS

Passing Sieve	Retained Sieve	Gravel Per Cent	Pea Gravel Per Cent	Fine Sand Per Cent	Coarse Sand Per Cent
1½-inch	1-inch	8.5	—	—	—
1-inch	¾-inch	23.5	—	—	—
¾-inch	½-inch	30.0	—	—	—
½-inch	No. 4	36.0	71.3	—	4.0
No. 4	No. 10	2.0	28.7	—	16.0
No. 10	No. 40	—	—	17.5	35.0
No. 40	No. 80	—	—	70.0	21.0
No. 80	No. 200	—	—	11.0	3.5
No. 200	—	—	—	1.5	0.5

made up as follows:

Pea gravel and large gravel together.....1,160 pounds
Fine and coarse sand together.....750 pounds
Asphalt.....90 pounds
Total.....2,000 pounds

Quantities

The quantities involved in constructing the airport were as follows:

Excavation, common.....52,000 cu. yds.
Fine grading.....719,000 sq. yds.
Excavation, base-course material.....96,500 cu. yds.
Tar prime.....91,700 gals.
Asphaltic concrete, binder course.....37,000 tons
Asphaltic tack coat.....10,900 gals.
Sand-asphaltic limestone, surface course.....13,600 tons
Electric duct, 4-inch.....6,100 feet
Drop inlets.....3
Concrete pipe, 30-inch.....1,580 feet

Personnel

The improvement of the runways at this municipal airport was carried on

as a result of the appropriation given by the Congress to the Civil Aeronautics Administration for the necessary improvements in a selected group of municipal airports. Outside of the runways, which were built by contract, all other work, including the buildings, entrance roadways, and the construction of concrete aprons, was done by WPA and supervised by the City Engineer.

In the interest of national security, the location and mention of personnel connected with wartime construction will be omitted from our articles for the duration.

Safety Posters Free!

Reprints of the Safety Poster on pages 26-27 are available gratis.

Black Now Vice President.

Amer. Brake Shoe & Fdry.

William M. Black, President of the American Manganese Steel Division of the American Brake Shoe & Foundry Co., has recently been elected Vice President of the latter company. Mr. Black joined the American Manganese Steel Division in 1912 and has been its President since 1940.

UNIVERSAL

Gas and Motor-Driven Arc Welders

SPOT WELDERS

High-Efficiency Transformer Arc Welders

Prompt Deliveries

UNIVERSAL POWER CORP.

4300-2 Euclid Ave., Cleveland, Ohio

Fast Dependable Operation at Lower Cost WITH HEIL EARTH MOVING EQUIPMENT



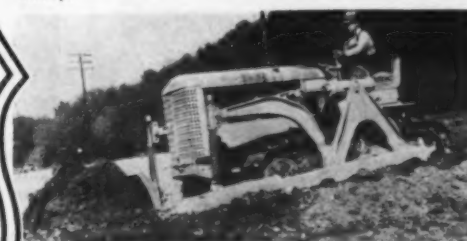
Heil Twin-Cable Scoops Save Money on Cable Replacement Costs. Available in 6, 8, 10, 15, 18, and 25 Cubic Yard Capacities.



Heil Cable Power Control Units for 45 to 150 H. P. Crawler Tractors. Double Drum Model II-illustrated.



Heil Hi-Speed Tractor-Scoop. 150 H. P. Heil Rubber-Tired Tractor and 15 Cu. Yd. Heil Cable-operated Scoop.



Heil Hydraulic Trailbuilders and Bulldozers Give You Fast Dependable Service. Sizes for All Cletrac Tractors.

National Carbide FLOOD LIGHTS



VALUABLE IN PEACETIME A NECESSITY NOW

Simple in construction Economical in cost Dependable in operation Available in 1500, 8,000 and 16,000-candlepower units

Write for literature showing complete lines of Floodlights and Lanterns.

NATIONAL CARBIDE CORPORATION
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Heil Hydraulic Dig - N - Carry Scoop. 6, 8, 12, and 16 Cu. Yd. Capacities for Operation with Any Make of Tractor.



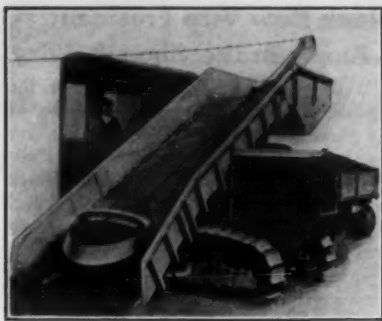
Heil Hydraulic Dump Units. Powerful, Fast Operating Heil Hydraulic Hoist and Rugged, Heavy Duty Dump Body.

FOR THE DURATION

Because it has become increasingly difficult to get new Roadbuilding Equipment, it is your patriotic duty to keep your present equipment operating for the duration. Rely on the service facilities of your Heil Distributor who will help you "Keep 'Em Rolling" for Uncle Sam.

THE HEIL CO.

Main Offices Milwaukee, Wis.



The new Sauerman Scraper-Loader.

New Scraper-Loader For Excavating Jobs

For excavating or material-rehandling jobs where a mobile drag scraper is required for loading to trucks, cars, conveyor belt or other means of transport, Sauerman Bros. has developed a new scraper-loader. This is a 1-cubic-yard machine consisting of a Sauerman drag scraper and a rocking ramp up which the Crescent bucket moves to load the truck or belt.

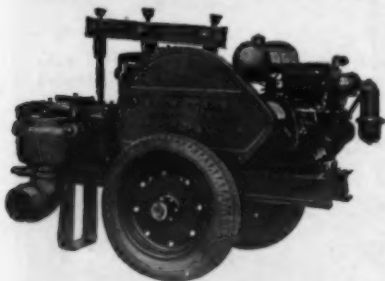
The machine is operated by a 60-hp gasoline or diesel engine or by a 40-hp electric motor, its standard operating span being 400 feet. The entire ramp and hopper structure rests on two pivot pins on top of the loader frame, at about the point of balance. A small ballast pocket in the hopper permits the balance to be adjusted to suit. The lower or front end of the ramp is attached to brackets on the crawler frame by pin-connected pipe struts and also by a self-contained hydraulic ramp or dash-pot. When it is desired to raise the ramp for travel from one place to another, the scraper is pulled onto the ramp by winding up the cables. The dead weight of the scraper unbalances the ramp; the pipe-struts are unpinning; the by-pass cock of the hydraulic dash-pot is opened; and the ramp is raised by its own weight. Upon arrival at a new location, the ramp is lowered by stringing out the back-haul cable, pulling the scraper bucket to the bottom of the ramp, and in general reversing the operation by which the ramp was raised.

The manufacturer states that in making an excavation 400 feet wide or in rehandling material from a stockpile of similar width, the average length of haul will be approximately 200 feet and the average hourly capacity of the Scraper-Loader will be 40 cubic yards.

Further information on this new Scraper-Loader may be secured by those interested direct from Sauerman Bros., 464 So. Clinton St., Chicago, Ill., by referring to this item.

Buy a share in peace and freedom.
Get some War Bonds today.

4" Single Mud Hog Pump on Pneumatic Wheels



The "Old Reliable" Mud Hog brought up to date.

Gearing enclosed—running in oil.

All cut gearing.

Die-forged crankshaft in pump.

Available in the ball valve Force type, or the flat valve Open Discharge.

Send for Bulletin No. CEM-40-D.

MARLOW PUMPS RIDGEWOOD, NEW JERSEY

Take Care of Trucks; They're Hard to Replace

Present forecasts of the use of motor-truck transportation facilities during 1942 and succeeding years indicate that unless immediate action is taken to conserve and providently utilize hauling facilities and equipment, the movement of essential military traffic and foodstuffs may be impeded.

In a recent release, the American Road Builders' Association points out that in 1941 approximately 700,000 new trucks were put in service in the United States. For the 2-year period 1942 and 1943, there are available for all purposes only about 150,000 new trucks. The normal rate of depletion removes approximately 420,000 motor trucks from service each year.

It is, therefore, a matter of simple arithmetic to figure out that unless we keep in service the trucks we now have, by taking particular care of them and of the tires on them, there just will not be enough trucks for our ever-increasing

needs. We should like to suggest once more, at the risk of being repetitious, that very truck owner and operator in the construction field do his part to keep his trucks running at maximum efficiency and economy just as long as possible. This applies equally to those who have high priority ratings because of vital wartime construction jobs and therefore may be allowed to purchase new units as to those whose ratings are much lower or nil. It is every patriotic American's duty and privilege to conserve and take care of the equipment and materials he now has, so that every bit of material and equipment available can serve in the war effort as soon as possible.

Briody New Field Engr. For Keystone Asphalt Co.

The Keystone Asphalt Products Co., Chicago, Ill., announced recently the appointment of B. C. "Mike" Briody as Field Engineer. Mr. Briody, former vice president in charge of the Highway Divi-

sion of Truscon Steel Co., pioneered the original steel longitudinal joint for concrete-road and airport-runway construction, and in his new capacity will work with construction engineers in introducing the new Keystone center strip and other Keystone construction products.

New Trail-Dump Catalog

The Koehring Model 120 Trail-Dump, which was developed and put on the market during the past year, is described and illustrated in a new 16-page color catalog recently issued by the Koehring Co., 3026 W. Concordia Ave., Milwaukee, Wis. Suitable for high-speed dirt hauling, the Trail-Dump is presented as a complete unit, with individual assembly pictures, depicting the operating functions and many special features, as well as with many on-the-job photos.

Copies of this new catalog may be secured by those interested in economical speedy dirt moving direct from the manufacturer or from this magazine.

CHICAGO PNEUMATIC NEWS

DRIVES SHEETING 4 FEET PER MINUTE IN GRAVEL



↑ DRIVING 4 FEET per minute in gravel is an easy performance with a CP 118 Sheet-ing Driver; does the work of ten men with mauls. Enables you to use sheeting over and over because there is none of the "brooming" that comes with hand driving.

CP SHEETING DRIVER DOES WORK OF TEN MEN WITH MAULS

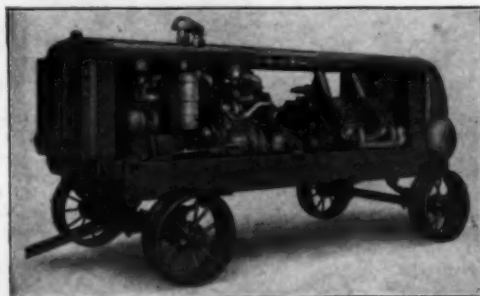
One of Many Time-Savers for Contractors

NEW YORK (CP)—A sheeting driver that puts down sheeting in gravel at the rate of four feet per minute... portable air compressors that deliver 15% to 35% more air per gallon of fuel... concrete vibrators that will top eight cubic yards of concrete in two minutes—these are just a few of the many time-saving items of CP equipment for contractors.

Write for data on the complete line of CP Contractors' Equipment—portable and stationary compressors, rock drills, wagon drills, demolition tools, diamond drills, pneumatic tools, concrete vibrators, electric tools, etc.

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 E. 44th St., New York, N. Y.



↑ 500 CUBIC FEET OF AIR ON WHEELS... Chicago Pneumatic Diesel-driven portable air compressor. The new CP Gradual Speed Regulator automatically, gradually—not by steps—synchronizes engine speed to rise and fall of air demand. No sudden acceleration or deceleration to cause fuel losses and wear and tear. Gasoline-driven and Diesel-driven models from 80 to 900 c.f.m. actual capacity.



↑ NO PRIMING NECESSARY. Simply turn on the air, lower the unit into the water and the CP Portable Sump Pump goes to work immediately. Water-tight casing; muck cannot get into the motor.

← 8 CUBIC YARDS OF CONCRETE topped in two minutes by four men with two CP 518 Pneumatic Vibrators. There are seven models of Chicago Pneumatic Concrete Vibrators, pneumatic and electric.

CHICAGO



PNEUMATIC

CONTRACTORS' EQUIPMENT

Air Compressors, Rock Drills, Pneumatic Tools,
Vibrators, Pumps, Electric Tools, Diesel Engines

Proper Care of Hose Will Conserve Rubber

(Continued from page 2)

steam pipes. Hose with fabric covers will mildew if kept in damp musty places, and mildew works fast, sapping the strength of the hose. Always coil hose on a floor, if it is dry, or on a shelf. Don't hang it on nails, hooks or brackets, which strains and weakens it.

Air, Oxygen and Acetylene Hose

The use of these gases with hose requires watchfulness against possible dangers. A hot piece of metal or a welding spark can quickly puncture a hose gas line and result in serious damage by explosion or fire. Kinking or shearing of hose by falling objects can produce similar results.

Air lines should be protected against inner attack by hot oil, discharged from compressors. Hot oil swells the rubber tube and allows it to buckle which breaks adhesion with the carcass and the tube will either crack open or become porous and break down upon continued contact with hot oil. Compressors should be provided with suitable filters and oil traps, and should be inspected regularly to insure the delivery of oil-free air to the lines.

Steam and Water Hose

The selection and care of steam hose is doubly important because unexpected failure involves danger and injury to personnel. The best types of steam hose are constructed to be burst-proof. But it is essential that steam hose be subjected only to recommended working pressures since, as temperature increases with pressure, the danger increases out of all proportion with the amount the proper pressures are exceeded.

Water hose should be provided in an ample length for the job intended, as stretching hose often shortens its life. Bending, kinking and dragging water hose over rough surfaces and allowing it to be crushed by trucks rolling over it are practices which can be avoided with a little care.

Facilities should be provided so that water can be shut off at the head end of the hose, rather than at the discharge end. It should be wound on a reel, if possible, and stored in a protected location. It should always be drained after use, and never left where water inside the hose is subject to freezing temperatures.

Paint Spray Hose

All paint hose should be cleaned care-

fully with mild solvents and blasts of air after each use. Solvent and paint left continuously inside these types of hose will extract pigment and other materials from the rubber tube, resulting in a gradual destruction of the hose from within and a constant source of annoyance in the discoloration of light-colored paints. Solvents containing toluol, butyl or amyl acetate can be used only in synthetic or metal-lined hose, since no rubber has ever been compounded to withstand their actions.

Couplings

Always select the proper type and size of couplings and clamps for use with your hose. If in doubt, check this with a sales engineer. All couplings should be carefully inspected before installation to see that burrs, serrations, and other sharp edges are not present. If they are, they should be carefully smoothed off with a file. Cuts and gouges in hose tubes usually do not show up right away, but they always reduce service.

Where couplings are tight-fitting, soap or rubber cement can be used as safe lubricants. Never use grease, and never ream out the hose to accommodate the fittings. Place the coupling in a vise and force the hose straight over the sleeve. Never drive the coupling in with a mallet or hammer.

Rubber and Victory

Rubber is one of the most vital and necessary materials for war production. And in these days of mobile units and mechanized armies, much more of it is needed than we have available at the present time. Therefore, every ounce of rubber which you can save by making your present rubber equipment last longer is another blow at the enemy.

And, incidentally, when your hose, tires and other rubber goods are absolutely beyond further service to you, don't throw them away. Turn them in at salvage stations, as some good rubber can be reclaimed from them for many other uses. Your country needs rubber, so don't waste it.




PRACTICAL ARC WELDING

This New book shows you hundreds of ways to SAVE TIME and MONEY in arc welded construction

"I keep a copy handy on every job we handle. Speeded up many a project with Hobart Welders. Collected handsome bonuses. Hobart keeps my equipment in tip-top shape right on the job."

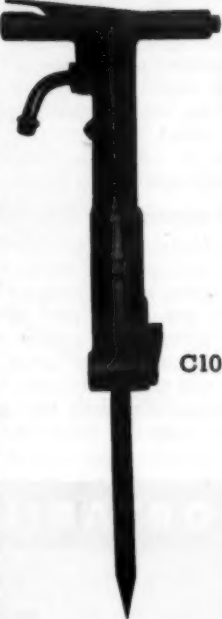
HOBART BROS. CO., Box CE-72, TROY, OHIO

HERE'S WHAT YOU NEED for that PAVING BREAKER JOB



C7

C9



C10

ASSUMING that you already have a good compressor, you will want to select the right Cleveland Paving Breaker. Model C7 is the right tool for the average job. It weighs 80 lbs., and two C7's can be run from a Number 85 compressor. If the work is heavier, you may want to try out the C9, which sells at the same price as the C7, weighs two pounds more, but uses no more air. C9 is the slugger that is a winner in the toughest, reinforced, well-seasoned concrete. For the light job, for trimming, etc., you will select the small No. C10, the little fellow with the big wallop. Three C10's can be run from your No. 85 compressor. ★ Then for the accessories—"Cleva" chisels, moils, and miscellaneous paving breaker tools cost you a little more, but save money in the long run. Usually the 14" narrow chisels are selected. They cut more than moils, but cost no more. For air hose, specify Cleveland "Veribest"—It's tough and will stand the service. Costs no more than other first-class hose. Connect it with Cleveland Type "A" hose couplings—quick-acting, durable, and they don't waste your air. ★ Send for Bulletin 128 that tells you how to get the most work out of paving breakers at the least cost.


★

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**THE STRONGEST
GEARED
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FOR ITS
WEIGHT
IN THE
WORLD**



ALL STEEL HAND HOIST

SEATTLE, U.S.A.

CONTACT—POWERFUL—SAFE
"For use where power is not practical or available"
Manufactured in 2, 5 and 15-Ton Sizes.
For capacity comparison, 1/2" cable used:

2-Ton "Lightweight"	75 ft.
5-Ton "General Utility"	250 ft.
15-Ton Triple-Geared "Special"	1200 ft.

Patent instant gear change and positive internal brake that never fails, and will lock load.

Gear Ratios

2-Ton 4, & 22 to 1	60 lb.	\$ 50
5-Ton 4, & 24 to 1	110 lb.	\$ 75
15-Ton 4, 19 & 109 to 1	680 lb.	\$250

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3734 6th Ave., So., SEATTLE, WASH.

Warehouse stocks for dealers' supply: Seattle—Chicago—Brooklyn—Houston. Complete Literature and List of Dealers in Principal U. S. Cities and Foreign Countries Gladly Mailed.

Resin Waterproofing For Air-Base Roads

(Continued from page 15)

weather, no difficulty was experienced with drying out the base because surface aeration helped evaporation and water in the lower portion was readily carried off by the porous sand below. This is quite different from conditions reported on resin-treated base construction at a Housing Project of the Maritime Commission built by the Navy. There the ground water was so high that it was impossible to dry out the treated base, which resulted in numerous base failures because of the impossibility of aerating the material sufficiently and rapidly enough to reduce the water content so that the base could be compacted and the water-repellent characteristics of the resin developed.

Conditions similar to those at the housing project had previously been experienced on a resin-treated section at the Bachelor Officers' Quarters at the Naval Air Station, where the resin had been introduced but compaction was not completed before a series of heavy rains started. During this period the base became very wet and unstable. When it had dried out sufficiently, however, equipment was put to work to aid in aerating the base and reducing the water content so that it could be compacted. There was no evidence that the resin lost any of its waterproofing qualities when this section had been dried and compacted. After compaction, the base was closely inspected to determine whether any small section contained excess moisture. When found, the soil was removed completely and drier resin-treated sand-clay obtained from windrows was hand-tamped in place of the wet material. This expedient proved successful in completing the waterproofed base throughout the entire section.

Surfacing the Treated Base

In general, the resin-treated base for streets and parking areas at the Naval Air Station was primed with 0.2 to 0.3 gallons per square yard of cut-back asphalt, although tar primer was used on roads in two of the areas. After the prime was allowed to cure, 0.45 gallons of semi-solid asphalt was applied and covered with 0.5 cubic feet of No. 12

slag per square yard. On the section known as the South Parking Area of the Cadet Officers' Barracks, which was converted into volley ball and basket-ball courts, after the slag was rolled and allowed to cure several days it was covered with 0.12 gallon per square yard of cut-back asphalt as a tack coat and was then covered with 30 pounds per square yard of a cold-mixed sand asphalt, spread

and finished by motor patrol graders, and then rolled by a 5-ton tandem roller.

Personnel

The paving operations, including the preparation of the resin-waterproofed base at this Naval Air Station, were done under a contract awarded by the Public Works Department of the Naval Air Base.

In the interest of national security, the location and mention of personnel connected with wartime construction will be omitted for the duration.

Get in the scrap! One of the critical materials in the war effort is scrap iron. Look around your yards and shops for old scrap, and put it to work for your country.



**CONTROLLED SPEED
OF OPERATION**

Modern wartime parachutists control speed of descent and directional drift by shroud-line manipulation. Owen bucket closing speed is inversely proportionate to closing power and adjustable reeving makes possible maximum closing speed or maximum closing power whenever either are required by digging or rehandling conditions.

THE OWEN BUCKET CO. • 6030 Breakwater Ave., Cleveland, O.
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OWEN BUCKETS
A MOUTHFUL AT EVERY BITE



New Target for Industry:
**More Dollars Per Man Per Month in the
PAY-ROLL WAR SAVINGS PLAN**

**EVERYBODY
10%
EVERY PAYDAY**



TO WIN THIS WAR, more and more billions are needed and needed fast—AT LEAST A BILLION DOLLARS A MONTH IN WAR BOND SALES ALONE!

This means a *minimum* of 10 percent of the gross pay roll invested in War Bonds in every plant, office, firm, and factory in the land.

Best and quickest way to raise this money—and at the same time to “brake” inflation—is by stepping up the Pay-Roll War Savings Plan, having every company offer every worker the chance to buy **MORE BONDS**.

Truly, in this War of Survival, **VICTORY BEGINS AT THE PAY WINDOW.**

If your firm has already installed the

Pay-Roll War Savings Plan, now is the time—

1. To secure wider employee participation.
2. To encourage employees to increase the amount of their allotments for Bonds, to an average of at least 10 percent of earnings—because “token” payments will not win this war any more than “token” resistance will keep the enemy from our shores, our homes.

If your firm has not already installed the Pay-Roll War Savings Plan, *now is the time to do so.* For full details, plus samples of result-getting literature and promotional helps, write, wire, or phone: War Savings Staff, Section E, Treasury Department, 709 Twelfth Street NW., Washington, D. C.



U. S. War Savings Bonds

This space is a contribution to America's all-out war program by
CONTRACTORS AND ENGINEERS MONTHLY

PORTABILITY



Out in the West asphalt plants are moved frequently and over long distances. It is not unusual for a plant to produce 100,000 tons between April and November and be dismantled, moved and set up six different times.

Madsen engineers know how to give you more portable asphalt plant equipment—No restrictions are imposed upon capacity as a result of greater portability. You will find a certain neatness of design, directness of purpose built into the character of Madsen asphalt plant equipment—from their smallest plants up to the big 3-ton batch units.

MADSEN
IRON WORKS
HUNTINGTON PARK, CALIFORNIA



New

A new drills for operations in land R and ha work. two or with ei saddles with th which mounte

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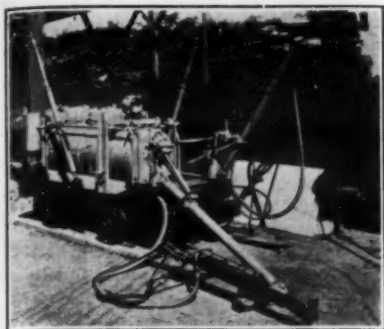
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A—





The new Cleveland MDR jumbo.

New Compact Jumbo For Rock Tunneling

A new method of supporting drifting drills for rock tunnel and mining operations has been developed by The Cleveland Rock Drill Co., Cleveland, Ohio, and has proved its value in wartime work. The MDR rig consists of either two or three booms mounted on a frame with either banjo or standard column saddles. This efficient device does away with the use of jack-screw columns on which drifters have previously been mounted.

One of these rigs may be mounted on an industrial-gage mine car, equipped with a large water tank, air receivers and ceiling jacks, and thus be set quickly ready for operation. Only two hose need to be connected to the rig instead of the usual two per drifter. Since the saddle is very low the lifters can usually be drilled without turning the drill under the bar.

Attention is called to the safety and economy features of the MDR rig. There are no blocks and wedges which are likely to loosen up, dropping the drifter and mounting with danger to the crew. More accurate spacing of drilled holes in railroad, water and drainage tunnels is possible, resulting in as much as 25 per cent increases in rock breakage, according to the manufacturer. The drill supporting arms are easily swung laterally for drilling holes, for changing wires, or for starting enlargements in the tunnel, or cross cuts. Similarly, the arms are readily swung to the rear for taking up bottom or for deepening drainage trenches.

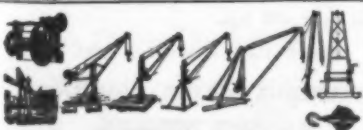
Bulletin 131 describing and illustrating the MDR rig in detail will be sent promptly on request to those mentioning this item.

Asphalt Construction Specifications Revised

Twenty newly revised Asphalt Construction Specifications, in seven classifications from high types "A" down to surface treatments "S," have just been issued by The Asphalt Institute. The revision was made to incorporate the U. S. Bureau of Standards Simplified Practice relating to the gradation of aggregates; the most recently developed equipment essentials; and the latest Institute recommendations, based upon a correlation of its laboratory studies and field engineering experience.

The list of these new Asphalt Construction Specifications is as follows:

A-1—Specification for Asphalt-Macadam Surface Course (Penetration Method with Asphalt Cement)



Complete Line
of
DERRICKS
and
WINCHES

SARGEN DERRICK CO.
3191 W. Grand Ave. Chicago, Ill.

- A-2—Specification for Asphalt-Concrete Surface Course (Coarse Graded Aggregate Type)
- A-3—Specification for Stone-Filled Sheet-Asphalt Surface Course
- A-4—Specification for Sheet-Asphalt Binder and Surface Courses
- B-6—Specification for Patching, Reducing Crown and Correcting Profile (Of old surfaces which are to serve as foundations)
- B-7—Specification for Asphalt-Macadam Base (Penetration Method with Hot Asphalt Cement)
- B-8—Specification for Asphalt-Concrete Base (Black Base) (Coarse Graded Aggregate Type)
- CL-1—Specification for Cold-Laid Asphaltic Plant-Mix Surface Course (Primed Macadam Aggregate Type)
- CL-2—Specification for Cold-Laid Asphaltic Plant-Mix Surface Course (Macadam Aggregate Type)
- CL-3—Specification for Cold-Laid Asphaltic Plant-Mix Surface Course (Dense Graded Aggregate Type)
- CL-4—Specification for Cold-Mix Cold-Laid Emulsified Asphalt Plant-Mix Base and Surface Courses (Dense Graded Aggregate Type)
- CP-1—Specification for Stockpile Asphalt Paving Mixtures for Making Quick Repairs of Bombed Surfaces
- MP-1—Specification for Modified Penetration Emulsified Asphalt Surface Course
- RM-1—Specification for Asphaltic Road-Mix Surface Course (Macadam Aggregate Type)
- RM-2—Specification for Asphaltic Road-Mix Surface Course (Dense Graded Aggregate Type)
- S-1—Specification for Asphalt Surface Treatment or Retreatment of Old Bituminous Surfaces
- S-2—Specification for Asphalt Surface Treatment of Waterbound Surfaces

- S-3—Specification for Asphalt Surface Treatment of Loosely Bonded Surfaces
- S-4—Specification for Emulsified Asphalt Surface Treatment of Old Bituminous or Other Paved Surfaces (Particularly Adapted to Smooth Texture Surfaces)
- S-5—Specification for Emulsified Asphalt Single and Double Surface Treatments of Waterbound and Rough Texture Surfaces

Copies of any of these specifications are available without charge upon request to The Asphalt Institute, 801 Second Ave., New York City.

New Robins Branch Mgr.

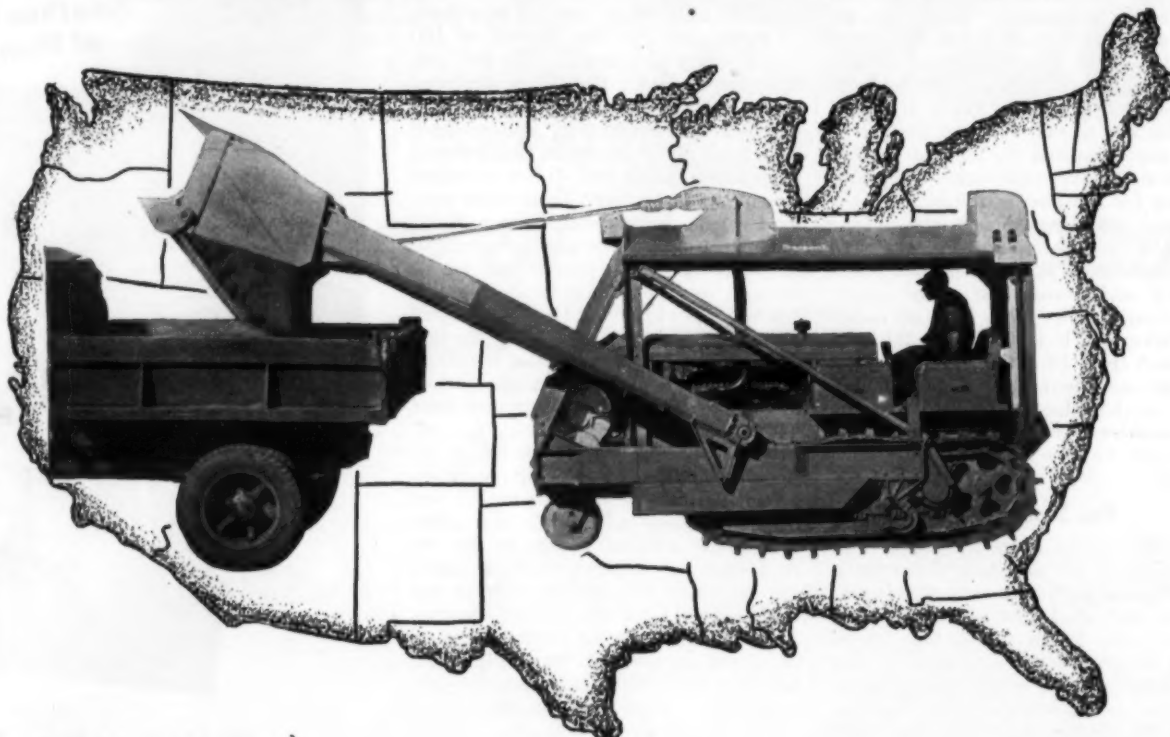
Announcement has been made by the Robins Conveying Belt Co., Passaic, N. J., of a change in the management of its branch office located at 215 Rockefeller Bldg., Cleveland, Ohio. Maurice B. Bradley, who has been in charge of this office since 1924, is now in active service as a Major in the Coast Artillery Corps of the U. S. Army, and the Cleveland office is now under the supervision of S. F. Knight, who will continue in charge of the Detroit office at 506 Curtis Building.

Fillet Welding Technique For Speeding Production

A new bulletin entitled "The 'Fleet-Fillet' Welding Technique for Speeding War Production" has recently been published by The Lincoln Electric Co., Cleveland, Ohio, in the interest of the war effort. Planned as ready reference material for plant production officials, welding operators and all others concerned with welding, this 18-page bulletin describes the "Fleet-Fillet" technique, which is claimed to permit up to 100 per cent faster fillet welding, and by means of text explanation, photos and sketches compares this and conventional techniques as regards angle of electrode, weld penetration, weld strength, deposited metal and speed of welding, for both single and multiple-pass welds. The cost of fillet welding by this method is reported to be one-third to one-half less.

Copies of this bulletin, No. 432, may be obtained by writing direct to the manufacturer and mentioning this item.

From MAINE to CALIFORNIA . . .



CLETRACS with SARGENT OVERHEADS are getting TOUGH JOBS DONE

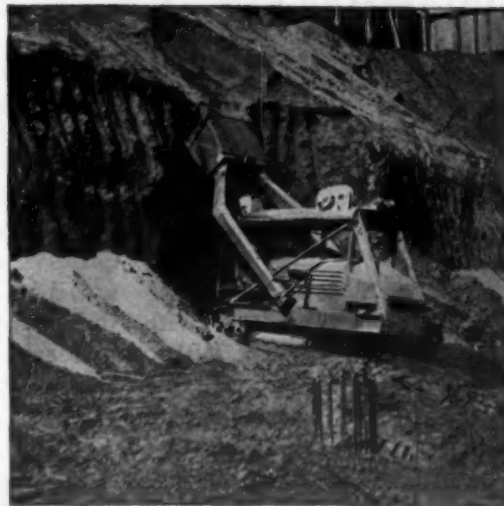
From Maine—through the East—Cletracs with Sargent Overheads are at work on airports, unloading ships, busy with essential town, city and county work . . . digging, loading, lifting, bulldozing, grading. . .

Throughout the country to the west coast Cletracs with Sargent Overheads are doing the same thing . . . you'll find them used for exceptional jobs, like loading tons of sugar beets . . . excavating in hard shale and adamant-like clay . . . working on soil erosion projects . . . building access roads . . . doing their part in every phase of government construction for the war effort . . . and saving private contractors valuable man-power and man-hours because of its power and versatility. . .

Wherever the going is tough, you're sure to see Cletracs with Sargent Overheads doing every imaginable job with less effort, less fuel, less expense, and in less time, all the year 'round.

CLETRAC OWNERS!

Your Cletrac Model B, C or D will be at maximum efficiency and production capacity if equipped with the Sargent Overhead! Put a Sargent Overhead on your Cletrac and boost your income. It is the unbeatable combination of shovel, bulldozer and TRACTOR in one compact controlled unit.



Above: Cletrac with Sargent Overhead digging a basement out of tough California clay, for a Los Angeles contractor who is building the \$1,145,000 Union Square Garage.

THE CLEVELAND TRACTOR COMPANY, CLEVELAND, OHIO

Grading, Overpass On N. H. SN Highway

(Continued from page 7)

ward. The fills were built up and then excavated 2½ feet for the new cast-iron pipe which was connected up on November 2 after 50 working days. Excavation was continued with another 1¾-yard Lorain which worked on the traffic circle at the west end of the contract. Work was finally closed down at the end of the year because of weather conditions.

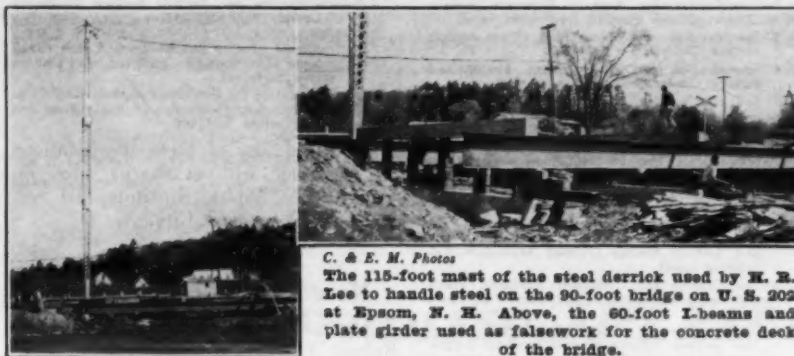
It was started up again on April 6, 1942, but with very limited crews because of the general labor shortage caused by military service and the demands of defense industries. Excavated material was loaded to a fleet of 14 Sterling trucks and the material was spread on the fills by two Bucyrus-Erie bulldozers mounted on International T-18 tractors.

There was very little rock to be handled on this job as the local material is mostly a silty hardpan. One Sullivan 110-cubic foot air compressor operated the single jackhammer which was all that was required to break up small boulders. On a 2,200-foot relocation, there was a channel change 500 feet long.

Nearly 20,000 cubic yards of gravel borrow and 62,000 yards of earth borrow were required on this job and in addition 37,800 cubic yards of gravel borrow for the base course between the subgrade and the pavement. One of the two 1¾-yard Lorain shovels was used in the gravel pit for loading both gravel borrow and gravel base. The gravel base course varies from 12 to 36 inches in thickness. It is 12 inches thick on fills and from 18 to 36 inches thick in cut sections where ground water conditions are bad due to springs. The job will be completed with a crushed-gravel road-mix surface 3 inches thick compacted.

The Traffic Circle

At the west end of the job, at the junction of U. S. 202 and State Route 28, is an elliptical traffic circle in which four centers were used to swing the arcs of the ellipse in the design. These four centers are arranged in a diamond shape so that two centers and the point of tangency of two arcs form a straight line. The radii of the flat sides of the ellipse are 132.53



C. & E. M. Photos

The 115-foot mast of the steel derrick used by H. R. Lee to handle steel on the 90-foot bridge on U. S. 202 at Epsom, N. H. Above, the 60-foot I-beams and plate girder used as falsework for the concrete deck of the bridge.

feet and of the ends 89.81 feet. The angle swung by the long radius is 80 degrees and 48 minutes and for the short radii 99 degrees and 12 minutes. The traffic circle is being paved with bituminous macadam.

Muck Removal

The secondary problem on the job was the removal of muck pockets in the traffic-circle area where the pockets were about 6 feet deep. In addition, on the Suncook approach to the circle from the south, there was a long muck area of which a distance of 125 feet was excavated by a shovel on mats up to a depth of 6 feet and then the balance of 100 feet went up to a depth of 15 feet. On this deep section, the fill was placed with a 10-foot surcharge and then boiler tubes with the bottom ends plugged were sunk along the center line and two other rows 15 feet and 30 feet on either side of the center line. These tubes were loaded with dynamite at the rate of ¼-pound plus per cubic yard of muck to be removed. This proved not to be enough, as approximately double this amount was required. The plugs in the bottom of the boiler tubes were punched out and the 40 per cent Atlas dynamite rammed down to form a pocket below the tube. The dynamite was not fired within the boiler tubes. In order to complete the removal of the muck, additional 1½-inch pipe was driven in diagonally along the edges of the fill and fired simultaneously with the other charges as a relief charge to get the mud wave out of the way. These relief charges made the smaller charges put in through the fill much more effective.

There was a second muck pocket on the north approach to the circle about 200 feet long with a maximum depth of 16 feet. In this case the mat of vegetation was removed first, while on the

covered with water during floods at this point so the grade was raised to the east, and on the west side of the railroad a low bridge 90 feet long was constructed. The structure is a reinforced-concrete slab bridge with three H-beam bents and two H-beam abutments, all comprised of 10-inch H-beams from 73 to 75 feet long. Some of these were spliced as they were driven up to 70-foot penetration. The maximum cut-off of any pile was about 6 feet. The ground in this section is a water-bearing sand. A reinforced-concrete strut spans the six piles of the bent at ground elevation, extending 1 foot 6 inches above ground and 2 feet 6 inches below. The deck of the bridge is reinforced concrete 1 foot 4 inches thick across which a 3-inch road mix will be placed.

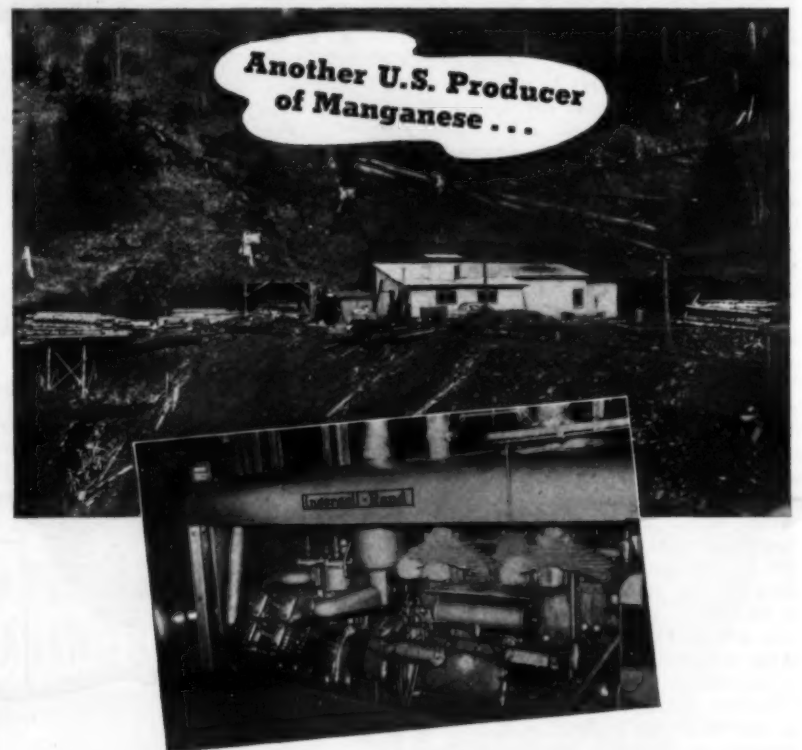
In the construction of the bridge, H. R. Lee of Manchester, N. H., subcontractor on the bridge and other structures on this job, used one 30-inch plate girder 60 feet long and two 36-inch I-beams of the same length carried on cribbing on

(Concluded on next page)

Suncook approach the mat was left in place. All other work on the north approach was identical with that on the Suncook approach.

Railroad Crossing

A single-track railroad, not much used, crosses the highway on a fill through a flood area of the Suncook River which flows to the west of the railroad. The old road was frequently



Waukesha Helps Expand Production of Strategic Metal

In an unnamed corner of the United States is the Mine. Being developed by the operators of one of the largest silver mines in this country, this unnamed property is believed to be the only new mine in the United States today producing metallurgical grade manganese.

Here again we find Waukesha Engines helping to expand the production of a strategic metal.

The larger illustration shows the mine dump, surface buildings and portal of the mine. The compressor unit shown is an Ingersoll-Rand 500 cfm air compressor, powered by a 125 hp. Model WAKH Waukesha-Hesselman Oil Engine.

All the air under pressure in the mine—used for the drilling machines, pump, hoist, and the

blacksmith shop furnace and sharpener—is supplied by this large I-R compressor unit. Its direct connected Waukesha Engine runs continuously 16 hours a day—often 22 hours daily. After ten months on this tough grind, the only maintenance has been adjustment of the valve tappets. That's not unusual—your up-keep costs on these easy-starting, low pressure, electric ignition Hesselmans are less than those of any other oil engine.

Waukesha Oil and Gasoline Engines for Industrial and Stationary Power range from 5 hp. to over 300 hp.

Get Bulletins 1079 and 1200.

WAUKESHA MOTOR COMPANY
WAUKESHA, WISCONSIN
NEW YORK TULSA LOS ANGELES

*** MORE POWER FOR VICTORY ***
WAUKESHA ENGINES

BUILT TO LAST AND MOVE DIRT FAST

WELDED ROLLED STEEL CONSTRUCTION

Cuts down excess weight, yet assures greater strength at vital points. Rivets used only at sections where quick replacement may ultimately be required. This welded construction, with other important features of Williams design, makes possible broader guarantees of long, profitable service.

Write for individual bulletin covering each type of Williams Bucket.

THE WELLMAN ENGINEERING COMPANY
7012 Central Avenue • Cleveland, Ohio

WILLIAMS Buckets
built by WELLMAN

Building New Section Of Strategic Network

(Continued from preceding page)

the struts to act as falsework for the deck. The piles and the falsework were handled by a steel derrick with a 115-foot mast and a 100-foot boom to which a 20-foot jib was added. The derrick was operated by a steam hoist. Concrete for the strut caps and deck was mixed on the job, the gravel and sand being weighed on Fairbanks wheelbarrow scales and mixed in a 2-bag Jaeger mixer.

Major Quantities

The major quantities on this contract, Project No. SN-FAP 15 (3), 41 (2), 210-B (3), 210-C (2), 225-G (1), for which bids were opened on June 26, 1941, were as follows:

Clearing and grubbing	9.75 acres
Removing abandoned road surface	6,400 sq. yds.
Explosives for muck removal	3,500 pounds
Earth excavation	51,625 cu. yds.
Ledge excavation	8,050 cu. yds.
Earth trench excavation	19,400 cu. yds.
Ledge trench excavation	1,715 cu. yds.
Earth channel excavation	1,520 cu. yds.
Ledge channel excavation	650 cu. yds.
Unclassified structure excavation	382 cu. yds.
Earth borrow	62,000 cu. yds.
Gravel borrow	19,600 cu. yds.
Gravel overhaul	15,300 cu.-yd.-miles
Fine grading	217,800 sq. yds.
Gravel borrow base course	37,800 cu. yds.
Gravel surface course	2,400 cu. yds.
Asphalt surface treatment	87,000 gallons
Road-mix pavements, crushed-gravel sand sealed	12,175 tons
Asphalt cut-back, pavement	137,400 gallons
Bituminous-macadam pavement	1,250 tons
Bituminous material for bituminous-macadam pavement	17,500 gallons
Concrete	678.4 cu. yds.
Reinforcing steel	62,810 pounds
Mortar rubble masonry	119 cu. yds.
Dry rubble masonry	60 cu. yds.
12-inch standard-strength r-o pipe	600 feet
15-inch standard-strength r-o pipe	1,200 feet
18-inch standard-strength r-o pipe	340 feet
24-inch standard-strength r-o pipe	830 feet
30-inch standard-strength r-o pipe	60 feet
24-inch extra-strength r-o pipe	84 feet
30-inch extra-strength r-o pipe	108 feet
6-inch vitrified-clay pipe	100 feet
8-inch vitrified-clay pipe	325 feet
8-inch bituminous-coated corrugated-metal pipe	790 feet
6-inch Class 100 cast-iron water pipe	90 feet
24-inch special cast-iron water pipe	850 feet
12-inch plain-concrete pipe	600 feet
15-inch plain-concrete pipe	200 feet
18-inch plain-concrete pipe	220 feet
Steel bearing piles	95,790 pounds
Bridge railing	194 feet
Plant-mix asphalt bridge floor	34 tons
Riprap	73 cu. yds.
6-inch bituminous-coated perforated corrugated-metal pipe underdrain	7,050 feet
12-inch bituminous-coated perforated corrugated-metal pipe underdrain	600 feet
15-inch bituminous-coated perforated corrugated-metal pipe underdrain	450 feet
18-inch bituminous-coated perforated corrugated-metal pipe underdrain	150 feet
Cable guard rail (wood posts)	7,200 feet
Wood guard rail (single rail)	180 feet
Beam guard rail	410 feet
Catch basins	37 each
Manholes	7 each
Curb board	7,700 feet
Maintenance of traffic	25,392 feet
Lam, 4 inches deep	8,345 sq. yds.
Lam, 6 inches deep	22,725 sq. yds.
Sod	1,945 sq. yds.
Fertilizer for grasses	8,430 pounds
Grass seed	725 pounds
14-inch Class 100 cast-iron water pipe	13,900 feet

Personnel

The 5.5-mile grading, paving and bridge contract described above was awarded to John Iafolla Construction Co., Inc., of Dedham, Mass., on the bid of \$340,781.35. Work was started August 4, 1941, discontinued December 31, 1941, and started again April 6, 1942. The total contract working days allowed were 150. George J. Nolfi was Superintendent for the contractor, and H. R. Lee, of Manchester, N. H., subcontractor



C. & E. M. Photo

A Ford V-8 with stake body carried this complete Lincoln Lubrigran outfit with Oilsum lubricants on the John Iafolla Construction Co. contract on U. S. 202 in Epsom, N. H.

for the bridge, was in personal charge of that work. For the New Hampshire State Highway Commission, Charles J. Downing was Resident Engineer on the highway work and Joseph J. Guilfo

was Resident Engineer on the bridge. Frederic E. Everett is Commissioner of Highways of New Hampshire.

Buy War Bonds—Preferred Security

Highway Maintenance With Calcium Chloride

Wartime restrictions on highway construction and the shortages of material and equipment have necessitated drastic modifications in pre-war road programs. For the duration, highway department operations will consist largely of maintenance, not only for normal upkeep but also for such improvement as conditions permit. Low cost and the preservation of existing facilities are now the keynotes.

A timely bulletin has recently been issued by the Calcium Chloride Association, 4145 Penobscot Bldg., Detroit, Mich., entitled "Surface Consolidation and Maintenance with Calcium Chloride." This 62-page booklet gives a detailed and illustrated presentation of the method and procedure in consolidation operations for low-cost roads and base development, emergency roads, and airport runways.

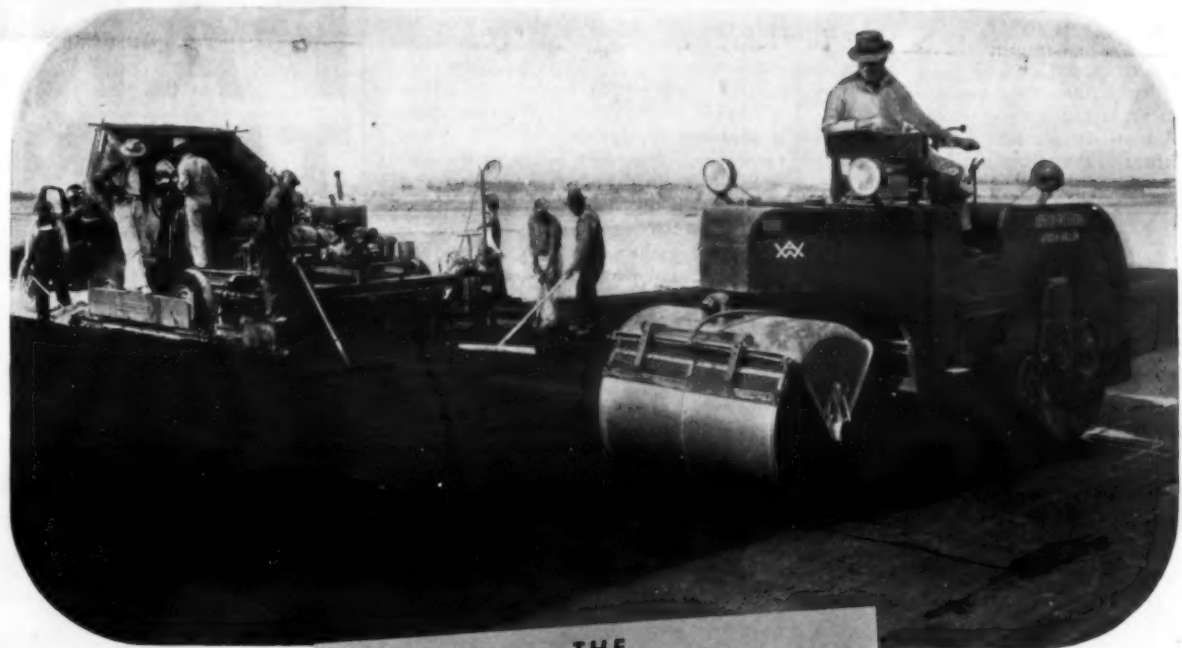
Copies may be obtained without charge direct from the Association.

GETTING THERE ON TIME...

with plenty of what it takes for quick, decisive Victory, requires that every addition to America's vital transportation system be completed in record time... calls for road-building equipment engineered to make every minute count.



DOES A LOT OF ROLLING JOBS A LOT FASTER



THE Austin-Western TANDEM ROLLER

• Your best bet for fast, accurate rolling of airports and strategic highways is the Austin-Western Tandem. Better visibility, more convenient controls, less frame overhang, and effortless hydraulic steer permit closer, faster work. Variable weight and smooth power provide accurate operation to meet the widest variety of rolling requirements. A-W Tandems change direction—forward or backward—

with a vibrationless smoothness that means a better job and less wear on the machine itself. A low center of gravity prevents side sway.

A-W variable weight Tandem Rollers in 5 to 8 ton and 8 to 10½-ton sizes are available for vital construction operations. Write for complete details on construction features and operating advantages.

THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Illinois

MOTOR GRADERS • BLADE GRADERS • ELEVATING GRADERS • SCRAPERS • CRUSHING AND SCREENING PLANTS • ROLLERS
ROLL-A-PLANES • MOTOR SWEEPERS • SHOVELS AND CRANES • SCARIFIERS • DUMP CARS • TRAIL CARS

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DUMPSTER
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Mfgd. by

DEMPSTER BROTHERS, Inc.
Knoxville, Tenn.

Essential Qualities For Road Engineers

What Is Required to Rate Tops in Maintenance, in Construction, in Materials? Here Are the Answers

THE construction of any highway is important and its location, type, design, specifications, as well as construction, should receive considerable study. Notwithstanding all this pre-natal care, it is doomed to a short rough life if it is not properly maintained from the very first day it is opened to traffic.

E. E. Scholer, Shell Oil Co., St. Louis, Mo., in discussing the broad subject of maintaining road surfaces with asphaltic mixtures at the Kentucky Bituminous Conference, at Mammoth Cave, Ky., gave more than usual attention to the qualifications of the Maintenance, Construction and Materials Engineers on whose shoulders rest the responsibility for creating and servicing the modern highway. Just what are these specifications? Read on and see.

The Maintenance Engineer

The Maintenance Engineer should above all be a soils expert and an authority on design. The reason for this is that the road is thrown into his lap lastly and, if there are any faults in design and inadequacies in base construction, he must be able to recognize them. The Maintenance Engineer should be able to check the base of a road difficult to maintain; to check the soil so that, if the base is not sufficient, it can be built up rather than to attempt to maintain a smooth riding surface only. This will save money in the long run, and is simple and easy to do with asphaltic materials, as with them you may strengthen the base as little as 1/2 inch or as much as is necessary.

A road surface may be thought of as a ship, and thus simplify the whole problem. A ship must have a sufficient displacement to carry the load to which it is to be subjected, and above all it must be waterproof. Our soils may become liquid or approach that stage. The road base must therefore be of sufficient thickness that it will provide proper and sufficient displacement and distribution,

so that it can carry the load intended for it. The base must be waterproof; otherwise it will sink and break up. This actually happens and is best illustrated by railroad ballast which often, over a period of years, sinks several feet below the ties.

The Maintenance Engineer might well clip this axiom to guide him and his associates: "Check the adequacy of the road base and its ability to hold water." Do this before distracting yourself over your inability to maintain economically a smooth safe riding surface.

The Construction Engineer

The Construction Engineer should likewise not only be a soils expert, but also a very human being as well as a diplomat. He must be a soils expert because that is the base upon which his road will be constructed, and it will determine the "heritage" of his road. The life of the road depends upon maintenance, but a body of good heritage is easy to maintain.

The Construction Engineer must be human in order that he may easily recognize what is not written into the specifications—those new problems which come up every minute and can not possibly be foreseen. He must be a diplomat in order to handle and correct the aforementioned problems with a minimum of change orders and personal friction.

The human element certainly enters into bituminous construction; more hot mixes are ruined by overheating than by any and all other elements. The Construction Engineer should always bear in mind that any bituminous material should never be heated beyond the point necessary to workability. Engineers can and do argue about workability. How workable is workable? We have there a problem similar to that of portland cement concrete, only in the bituminous field it is heat or diluents; theirs is water. The answer of course requires that "human element" but roughly speaking, "when the mix is a little tougher to handle than is desirable, it is just right; when it is just right, it is too workable"; either too much heat in the case of asphalt, or too much water in the

case of portland cement.

The message to the Bituminous Construction Engineer is therefore twofold: never overheat; and never demand too much workability either by heat or by diluents.

The Materials Engineer

We all know of course that the Mate-

rials Engineer is to blame for all failures. He passed inferior asphalt, or inferior aggregate, or this or that. The Materials Engineer has to be not only a soils expert, a chemical expert, and an engineer of design, but he must also, if he intends to hold his job, be a crystal gazer so that he may foresee all the

(Concluded on page 45)



You can depend upon the greedy jaws of Industrial Brownhoist clamshell buckets to speed up your material handling. Their deep clean bites practically eliminate hand shoveling. Fast opening and closing action. Extra sturdy. Minimum rope wear and maintenance. Standard types (rope-reeve, power-wheel, link-type) in stock for immediate delivery. Write for information.

INDUSTRIAL BROWNHOIST

HAY CITY, MICH. • DISTRICT OFFICES: NEW YORK, PHILADELPHIA, PITTSBURGH, CLEVELAND, CHICAGO

PARSONS TRENCHERS



HIGH SPEED TRENCHING!



WE'LL MOVE THE
EARTH
TO SERVE YOU

More trench per day, less cost per foot is the demand. Parsons Modern Trenchers are really saving time and money everyday on many important Victory plants and projects.

Time tested, heavy duty equipment is essential to maintain today's construction schedules. Parsons Trenchers are known the world over as fast efficient excavators.

Fast, Clean and Deep digging assured—Buy Parsons.

THE PARSONS CO., NEWTON, IOWA

Self-Cleaning KILLEFER Revolving RIPPERS



DO A better, more thorough job of breaking up shale, sandstone, and old macadam roads—use a Killefer Revolving Ripper. Five heavy digging standards work 14 inches deep, thoroughly ripping the surfacing for fast, easy, big-capacity loading of scrapers.

No cables, winches, or hydraulic units

are required to clean or lift this ripper—it's self-cleaning—the toolhead revolves and clears obstructions at a pull of the control rope.

Killefer Revolving Rippers are built in three heavy-duty models. Power requirements range from 35 to 95 horsepower. Long-wearing, sleeve-type points are removable and replaceable.

KILLEFER MFG. CORP., 5425 DOWNEY ROAD, LOS ANGELES, CALIF.

SOLD BY "CATERPILLAR" DEALERS EVERYWHERE

Road Organization In Yankton County

(Continued from page 10)

mat costs less than \$1,000 a mile to give a waterproof and dustproof surface, taking into consideration all costs and subtracting the cost of gravel maintenance for the year. These costs include:

7,000 gallons of oil at 7¢	\$490.00
400 cubic yards of aggregate hauled at 3¢ per yard-mile	72.00
50 yards of clay at 18¢	9.00
Water	50.00
Processing with 2 patrols for 15 hours at \$2.50 per hour	75.00
Rolling and brooming	50.00
Engineering	40.00
Total	\$786.00

Organization and Finance

Yankton County is 576 square miles in area, consisting of sixteen townships. Although it only has 275 miles of road in the county system, there are in addition about 400 miles of roads in the unorganized townships which must be cared for by the county highway organization. According to state law, the county road mileage, that is the official county highway system, can not be more than one third of the total of all state, county and township roads within the county.

There are five Commissioner Districts in the county, with three Commissioners being elected one year for a period of four years, and two at the election two years later for a period of four years. The Commissioners appoint the County Highway Superintendent for an indefinite period. F. W. Smith, the present County Highway Superintendent, was appointed Assistant Highway Superintendent in 1925, and has held his present office since 1933.

The county has a maximum 2-mill tax on personal property and real estate for the county road fund which brought in \$45,000 in 1941, including \$15,000 designated for the bridge fund. In order to take care of the township roads in the unorganized townships, \$10,000 was budgeted for 1941, but only \$5,000 was actually levied, which left \$5,000 which may be spent this year without an additional budget item.

From the state gas tax, Yankton County received \$12,000 in 1941 and from the motor vehicle tax \$23,000. These sums are proportioned as follows: 47 per cent of the total motor vehicle taxes collected in the County is returned to the counties in the state, 30 per cent to the townships, 20 per cent finances the construction and maintenance operations of the State Highway Department, and 3 per cent goes to the State Treasurer for administrative expenses. Of the gas tax, the counties receive 1/2 cent a gallon and the state, 3 1/2 cents a gallon.

The total budget in Yankton County for 1941 was \$45,000 for maintenance and \$35,000 for construction.

The New Central Garage

The county has recently completed a new central garage in the north portion of the city of Yankton, with a machine shop for handling repairs and provision for the necessary offices for the operation of the garage. In addition, there

is a two-acre tract about 1/2 mile north of Yankton where the county stores culvert pipe, snow plows and obsolete equipment before it is turned in or sold for junk.

A patrol station is maintained at Mayfield in the northeastern section of the county, and another at Lesterville in the northwestern section, with two motor patrols housed at each station.

Equipment

The county maintains a well-balanced equipment roster enabling it to handle its work expeditiously. The equipment includes:

- 2 Caterpillar No. 12 diesel power graders
- 1 Caterpillar No. 11 diesel power grader
- 1 Caterpillar No. 10 diesel power grader
- 1 Adams power grader with McCormick-Deering 10-12 engine
- 1 Caterpillar No. 212 diesel power grader
- 1 Allis-Chalmers Speed Patrol grader
- 2 Elevating graders
- 1 Caterpillar D8 tractor
- 1 Caterpillar D7 tractor
- 1 Caterpillar Twenty tractor
- 1 Caterpillar Sixty tractor
- 1 Allis-Chalmers 35 tractor
- 1 Diesel 75 tractor
- 2 Carryall scrapers
- 14 1 1/2-ton trucks, including four new dump trucks, 4 hopper-bottom dump trucks, 2 end-dump trucks, one with a gas tank, and one having the oil distributor mounted on it
- 1 3-ton International truck
- 1 Littleford 1,200-gallon asphalt distributor
- 1 110-hp steam boiler for heating asphalt cars
- 2 LaPlant-Choate V-type tractor snow plows
- 4 Caterpillar V plows for power graders
- 1 North Star V plow for a power grader
- 1 V-type snow plow for D7 tractor
- 1 Universal 936 crushing and screening plant
- 1 International 12 power mower
- 1 Topeka highway mower

The Snow Problem

Snow plowing has assumed less importance in Yankton County since the program of streamlining the cross section of highways began. It is in the section of the country where snow is generally accompanied by high winds so that no work is done on the roads until the winds have subsided. In cases where the snow piles up above a snow fence and drifts on the road, it is the custom to plow around behind the drift and make a snow trap to prevent further drifting across the road.

It has not been found necessary in Yankton County to have steam thawing equipment for the culverts, as they invariably thaw out ahead of the bulk of the snow.

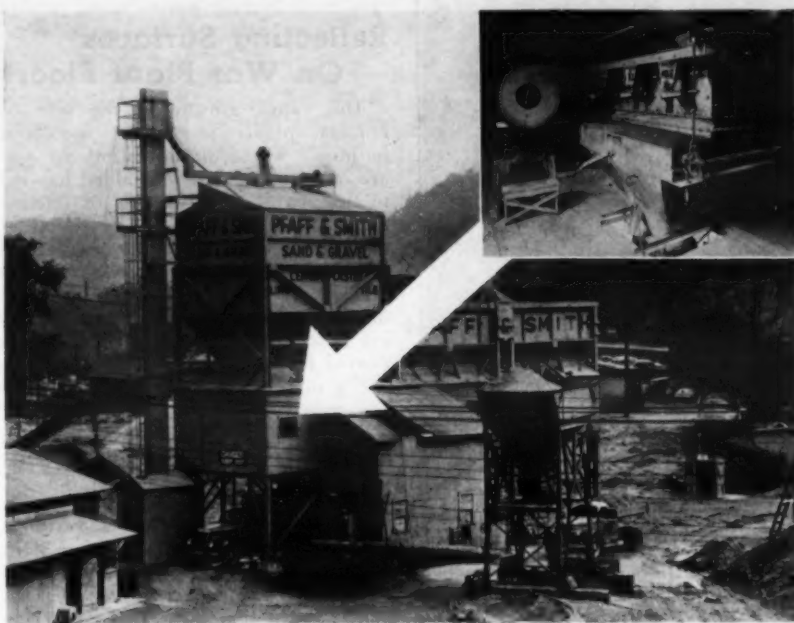
Jeffrey Awarded Navy "E"

On May 12, at appropriate ceremonies, The Jeffrey Manufacturing Co., Columbus, Ohio, was awarded the Navy "E" for excellence of work done in the production of naval materiel. The five factors on which such awards are based include the status of production as com-

pared with production schedules; amount of ingenuity shown in overcoming obstacles; degree of corporate reliance; willingness to assume new and difficult tasks; and evidence of desire for genuine and effective cooperation.

The presentation address was made by Captain Robert Henderson, U. S. N.

(Ret.), and Commander G. H. Bowman, U. S. N. (Ret.) presented the Navy "E" insignia. Robert W. Gillispie, President of Jeffrey, accepted the burgee for the company, and O. R. Ehret, who has seen 63 years of service with Jeffrey, accepted the "E" insignia for the employees.



Photos by Helisel Steel Form and Iron Company

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BATCHER PLANTS

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ACCURACY—SPEED—DEPENDABILITY

THE KRON CO.

Bridgeport, Conn.

Renewable TRACTOR RIMS FOR CATERPILLAR TRACTORS

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Sturdy steel replacements for Caterpillar Tractor drive sprockets and idlers... Designed for extra long life and heat-treated with proper toughness to guard against breakage... Easily applied on your present equipment at less cost than entire unit... Welding instructions furnished.

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Manufacturers of PACIFIC CRUSHING & SCREENING UNITS • PACIFIC SLUSHING SCRAPERS & SHEAVE BLOCKS • ALLOY-MANGANESE MILL LINERS & CRUSHER JAWS • PACIFIC ROCK BIT GRINDERS • HAND WINCHES • CRAWLER SHOES, TRACTOR RIMS and other Wearing Parts

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BULLETIN

Prolongs Life of Sprockets and Idlers

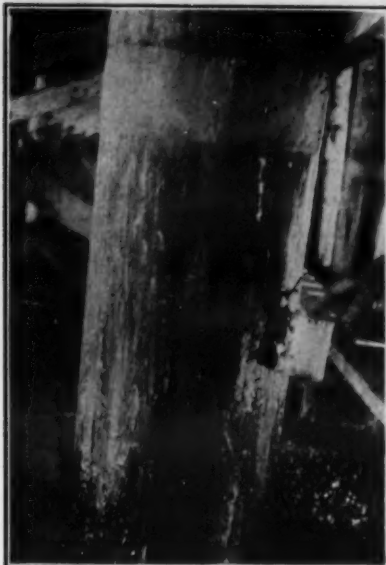
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WILL DRY UP ANY
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Sweating of a pile after application of creosote by the Toxic Refill method at the band above.

Kill Marine Borers In Infested Piles

Any method which will extend the service life of creosoted wood piling from which the creosote has leached will conserve much time, labor and material during a period when national conservation of service and materials is most essential. A method of providing continuous saturation of the sapwood shell of the pile, thus effecting the destruction of marine borers which have attacked the section where creosote has leached out of the wood, has been developed by Pile Protection Co., P. O. Box 634, Journal Square Station, Jersey City, N. J.

This Toxic-Refill method, when first adopted, was not entirely successful until the area of the pile exposed to tidal action was enclosed in a water-tight jacket. The continual lapping of the water over the wet area of the pile produced a continual leaching effect which reduced the strength of the creosote and permitted the entrance of marine borers. With this area protected by a specially designed concrete jacket, the creosote does not escape into the water in the tidal area but continues down the tube-like cells of the wood, previously creosoted, keeping the pile thoroughly saturated with fresh creosote. The fact that borers living within the piles die out and no new ones attach themselves, ac-

cording to T. H. Hansen, General Manager, Pile Protection Co., proves that the continuous saturation with fresh creosote will perpetuate the service life of piles as long as this method is continued.

Details of the Toxic-Refill method may be secured by writing to Pile Protection Co. and mentioning this item.

Reflecting Surfaces On War Plant Floors

The rapid growth in the size of bomber plants and other industrial buildings where our munitions of war are manufactured or assembled has led to two major developments of interest to the highway contractor. First, areas of floor in these great one-story structures are so great that complete concrete-highway paving outfits are required to finish the paving on time. Second, lighting in wide plants has been greatly improved by a $\frac{3}{8}$ -inch floor topping of a 1:2½ mix of white cement and white silica sand.

The effect of this white floor is remarkable, as the artificial illumination in an average factory is only 0.3 per cent of that in the shade of a tree on a summer day. A white concrete-surfaced floor will reflect 61 per cent more light than a gray concrete floor, or expressed in another way, will give 20 per cent more illumination in the area. The value of this reflected light in worker efficiency and in munitions production is very real.

A group of plants, each with floor areas of about 700,000 square feet for bomber assembly, was recently completed, using a selected white sand free of impurities which might discolor it and Atlas White cement for the surfacing mortar which was given a minimum mix of one minute. The mortar was dumped on the base concrete after the initial set had occurred in the base concrete, thus permitting the men to walk on it without marking it unduly. The mortar was hand-screeded and when it had started to set it was floated with Whiteman gasoline-powered finishers equipped with three 12-gage x 10 x 18-inch float trowels. The final finish was by hand trowels and then the $\frac{3}{8}$ -inch surface was protected against dirt with two sprays of one part sodium silicate to four parts water, allowing each application to dry before the next operation. Sisalkraft paper was then spread over the floor, lapped and sealed, and covered with 1 inch of dry sand to protect the light-reflecting surface during the re-

mainder of the plant construction operations.

Big Floating Plant For Emergency Power

A floating diesel-electric plant developed to produce power for a large dredge for less than ½ cent per kilowatt-hour has great possibilities on construction projects because of its flexibility, as well as to supplement existing power facilities in case of breakdowns, according to Gordon Lefebvre, Vice President and General Manager, The Cooper-Bessemer Corp., Mount Vernon, Ohio.

"It is possible," Mr. Lefebvre said, "easily to provide floating power plants, assigned to strategic areas, that could be towed quickly to affected districts and supply electric power until the land facilities were restored. Such marine power plants could be mounted on a barge of simple construction. Driven

by modern diesel engines, they would cost very much less than land plants of equal power-production possibilities."

The power plant which is back of this thought consists of ten diesel engines of 100 hp each, set five in a row on each side of a line shaft which runs down the center of the plant. Each engine is equipped with a Twin-Disc clutch and on the outboard side of the clutch shaft is an 8-groove pulley 15 inches in diameter. All ten of these diesels are connected to a single shaft that drives a generator at the far end. Any engine in the group can be disconnected from the shaft when desired.

We have had many pictures in the past of steam locomotives performing the function of supplying steam to a boiler plant in an emergency, and there is no reason why mobile plants, such as mentioned by Mr. Lefebvre, and mounted either on barges, or smaller plants on large trailers, could not supplement land plants in case of emergency.

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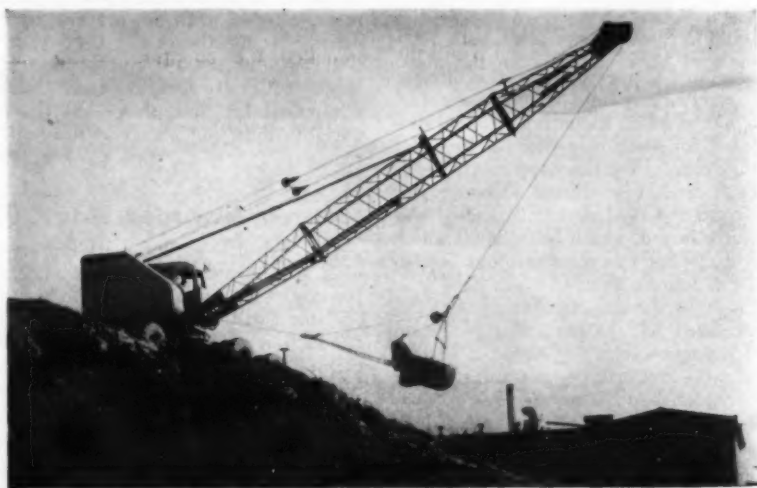
—"a friend indeed" in this hour of need!"

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Tires going—going—gone? Make ALL your tires last much longer by putting SAFETY-IZE in the tubes.

SAFETY-IZE, in your tires, will be ALWAYS ON THE JOB to plug and seal punctures, extending the life of the tires by guarding against under-inflation.

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GENERAL SUPERCranes CONSERVE VITAL FUEL, MAN-POWER and MACHINERY

GENERAL
SUPERCranes are selling faster than we can build them. Still, now is a good time to find out how you can save with a SUPERCrane. Ask for new catalog.

Powered by one motor and controlled by one man the SUPERCrane moves about freely on its pneumatic tires. Movement is much faster, with reduced wear on moving parts.

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Sizes: ½ to 2½ Cu. Yd.
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GENERAL

Sizes: ¾ - 1½ - 2½ Cu. Yd.
Diesel - Gas - Electric

THE GENERAL EXCAVATOR COMPANY, Marion, Ohio



Standardized Bridges On South Dakota Roads

(Continued from page 24)

umns and cap making up one pier or bent required about 12 hours with the concreting plant used. Aggregate was stockpiled on the approach fill and shoveled into wheelbarrows by three men, with an extra man to help out in the shoveling, and weighed on a Fairbanks wheelbarrow scale. A tank truck backed up near the 2-bag CMC concrete mixer which gave the aggregates and cement a thorough 1½-minute mix.

The concrete was wheeled down hill from the mixer by two men holding back on the handle and then, in pouring the sills, was dumped directly into the forms and finished by the carpenter foreman, with one man aiding in shoveling the material into the forms and the foreman watching carefully for honeycomb. In pouring the columns, a special method of unusual interest was used. The contractor has developed a special steel-cylinder pouring bucket which is 15 inches in diameter and will readily slide down inside the standard reinforcing of the pier columns. The steel cylinder is 7 feet long and has a heavy rod welded across the top for a bale. A separate straight rod with two guide braces runs from the top of the bucket to the disk bottom and has a ring in the top which is attached to a separate line from the crane. This line is held tight when the bucket is being loaded and lowered into the form. When the line is slack, the concrete runs out readily and saves much jarring of the forms in placing concrete in deep piers. In spite of the absence of vibrators, the concrete, which was slightly wetter than usual, showed no signs of honeycombing on the pier columns and with slight rubbing of the caps presented a most creditable appearance.

Quantities

The major quantities involved in the contract for this 206-foot bridge were as follows:

Class A concrete.....	390.6 cubic yards
Hand-rail concrete.....	15.21 cubic yards
Reinforcing steel.....	50,820 pounds
Structural steel.....	252,265 pounds
Treated timber piles.....	818 feet
Untreated timber piles.....	1,488 feet
Structure excavation.....	270 cubic yards
Unclassified excavation.....	2,570 cubic yards

The I-beam stringers for all spans consist of seven 33-inch 132-pound I-beams for the interior joists and two 33-inch 141-pound I-beams for the exterior joists, making a total of nine per span.

Personnel

This bridge is one of a series of small structures on FAP 193B (2) comprising 18.847 miles of grading on U. S. 77

south of Clear Lake, S. D. The grading was done by Dave Gustafson of Sioux Falls, S. D., and the structures were built by Bonesteel & Hyde of Wagner and Watertown, S. D. The structure described was built under the direction of G. H. Sherrill as Foreman for the contractor.

For the South Dakota State Highway Commission, the work was in charge of S. W. Gentle, Resident Engineer. This structure was built at a bid cost of \$25,453.85.

Bay State Methods To Improve Roadsides

Massachusetts has 4,500 miles of roads in the state highway system entirely in rural areas, that is, outside of incorporated places. Much of this mileage is the most important and most heavily traveled in the state. The Bay State now issues 6,000 permits for outdoor advertising signs, a shrinkage of over 4,000 signs since the state regulations were declared valid by the Supreme Court, according to Flavel Shurtleff in *Planning and Civic Comment*.

Less than 25 per cent of these permits, or about 1,400, are for locations in rural areas, and most of these are concentrated on the commercial routes. There are many miles of secondary highways, excellent motor roads, without a billboard. The great highways to Cape Cod are free from them, except for signs at filling stations. The same is true of the Mohawk Trail, the scenic east and west highway through the hills of western Massachusetts. It is possible to ride across the state north to south and east to west and get the impression that signs have been banned in the rural areas.

What has given Massachusetts this distinction? Public opinion, which compelled the adoption of the most drastic outdoor advertising regulations in the country, a Supreme Court opinion which subordinated the right of property and the right to advertise to the public welfare, and a courageous and able administration of the regulations are essentials in the Massachusetts program of roadside protection.

Two provisions are particularly helpful in the administration of the regulations: 1. No permit will be granted for the location or maintenance of billboards, signs or other advertising devices near certain public ways where, in the opinion of the Department, having regard to the health and safety of the public, the danger of fire, and the unusual scenic beauty of the territory, signs would be particularly harmful to the public welfare. It is this provision and the broad interpretation of the words "public welfare" which have swept billboards from the Cape roads, from the Mohawk Trail, and from long stretches of other main highways of the state.

2. No permit will be granted for the erection or maintenance of any billboard, sign or other advertising device unless the billboard, sign or other advertising device conforms to the size and distance from the public way as follows: If more than 25 feet in length and 12 feet in height and up to a maximum size of 50 feet in length and 12 feet in height, it must be at least 300 feet from the boundary line of any public way. It is further provided that this paragraph shall not apply to districts which the Department may determine are of a business character. Locations 300 feet from the highway are not readily saleable and the handicap of distance must

be overcome by other striking advantages of the site.

Massachusetts, according to Mr. Shurtleff, has convincingly answered the question, "Does state regulation of outdoor advertising pay?" There are other objectionable uses of highway frontage which regulations against the billboard will not touch, and for which the best remedy is comprehensive zoning. But until local and regional zoning can be speeded up or until the state can zone its principal highways, we must have more and better billboard laws.

Want information on equipment?
Write the Editor.

IF YOU WANT POWER, DURABILITY AND EASE OF HANDLING—

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You can drill holes
to a depth of four
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Lowest
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of its weight and
size on the market.
Gets amazing
results in hard clay,
hard pan, frost or
shale.

HARDSOCC DRILL CO., Ottumwa, Iowa

Ordinary Ditcher Teeth Dull in Three Days— HARD-FACED TEETH

Still Sharp
AFTER THIRTY DAYS!

STOODY TUBE BORUM* keeps ditcher teeth sharp...eliminates frequent shut-downs for tooth changes...cuts replacement costs up to 75%.

THE two ditcher teeth pictured above were used on the same machine and operated under identical conditions. The unprotected tooth at the left had to be sharpened every three days and was too short for further service after six sharpenings. But the Borium protected tooth at the right operated for 40 days and wore only ½". It was simply resharpened in the forge, retipped with Tube Borium, and put back on the ditcher for another 40 days' service.

*The Stoody Tube Borium rod is supplied in ¼"-½"-¾" and 1" diameters and is available for either oxy-acetylene or D.C. electric application. Prices and specifications are yours for the asking.

Before the tooth was finally worn out, it had operated a total of 120 days!

Tube Borium makes such savings possible because it contains particles of cast tungsten carbide, the hardest, most wear-resistant metal ever developed for commercial use.

Send for this free booklet which shows the type of rod to use for re-building and hard-facing various types of construction equipment. It shows the amount required per application, average welding time, welding procedure, and length of service that can be expected when the job is completed.

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Hard Facing Alloys

Geerpres MOP WRINGER

reduces mop costs from 25 to 50 per cent over other methods of wringing—retains the mop fabric in a soft fluffy condition most desirable for rapid mopping. No more loose mop strings to catch around legs of desks and furniture when using GEERPRES.

New construction makes this wringer last for many years. Made in two sizes, small size will wring mops 14 to 24 ounces inclusive, large size 20 to 36 ounces. Available with or without tanks. Send for free circulars and prices.

GEERPRES WRINGER, INC.

Manufacturers of High Grade Mopping Equipment
MUSKEGON, MICH.



DOUBLE, STAGGERED GEARS
CANNOT POSSIBLY SIDE SLIP
Gear Shaft Size Increased—Will
Not Warp Under Excessive Strains

Patent Pending

Rebuilding U.S. 51 Starting with Base

Louisiana Maintenance Crew Repairs Old Sand-Clay Base, Patches Binder and Wearing Courses for 10 Miles

REPAIRS to U. S. 51 east of La Place, Louisiana, became imperative in 1941 due to an increasing number of breaks in the old bituminous surface because of blue-clay pockets in the old fill. State maintenance forces started at the drawbridge over the outlet from Lake Maurepas into Lake Pontchartrain, and completely overhauled the base and binder for 10 miles into Ponchatoula, preparatory to a two and three-application surface treatment.

Base Repairs

In weak places where the blue clay had provided an inadequate foundation for the surface course and the heavy traffic using the highway, the old bituminous top was removed by scarifying and blading, and then the sub-base cored out with a power grader to a sufficient depth to remove all evidence of the blue clay in the original fill. These areas were backfilled with a satisfactory sand-clay, compacted by the tractor and a traffic roller, and finally by a 10-ton Hercules tandem roller. In some places this meant the replacement of a section of road as much as 50 feet long for the full width, in order to eliminate unsatisfactory foundation conditions.

A leveling, or binder, course was placed as patches to level off the roadway, using a material produced by contract in an asphalt plant set up just within the city limits of Ponchatoula.

The Asphalt Plant

The aggregates for the asphalt plant set up by Asphalt Materials Co., of Baton Rouge, La., to serve District 6, were delivered by rail in gondola cars and unloaded by hand to stockpiles. The aggregates consisted of sand with some pea gravel, gravel, fine sand, and slag. The gravel and sand with pea gravel were used in the binder-course mixes, while the pure sand and slag went into a surface mix which was loaded into trucks which backed up a ramp and loaded gondola cars for shipment of the material throughout the district. All base or binder material was produced for the job immediately at hand, and was hauled by trucks direct from the plant to the road.

Asphalt for the plant was delivered in tank cars to the site, from which the material was delivered by a steam-driven rotary pump either to an 8,000-gallon storage tank or into the steam-jacketed line to the weigh-bucket on the plant with the waste going to the storage tank. A vertical steam boiler mounted on the drier-mixer platform supplied steam for the vertical steam engine driving the plant and also for the asphalt pump and for heating the tank, as well as for atomizing the fuel oil for the drier.

The Warren Brothers plant is a com-

bined drier and drum-mixer plant, handling 3,000-pound batches. The cold elevator leading to the drier was fed by seven men wheeling in the aggregates, which required a 7-minute cycle through the drier and out the mixer to the waiting truck. No fuel-oil storage was provided, the fuel oil being used direct from the 55-gallon delivery drums and pumped to the torch by a fuel-oil pump direct-connected to the drier drive.

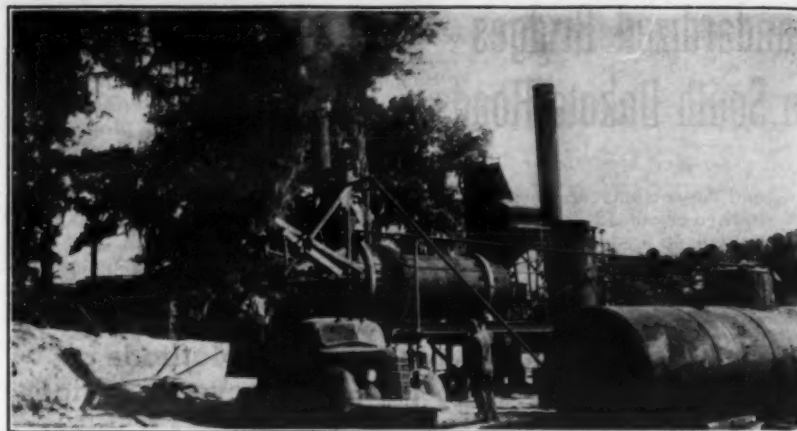
Gradation of Mixes

The base-course material produced at this plant was made up with 6 per cent RC-2 asphalt, which was the maximum amount allowed in the specifications, which named 4 to 6 per cent. The specification limits for base-course aggregate, consisting of the gravel and sand with fine gravel, were as follows:

Passing 1½-inch mesh and retained on ¾-inch mesh.....	5-30 per cent
Passing ¾-inch mesh and retained on No. 4 sieve.....	45-65 per cent
Passing No. 4 sieve and retained on No. 100 sieve.....	20-35 per cent
Passing No. 100 sieve.....	1-10 per cent

The surface-course material, which was also mixed in this plant but not used on this project, consisted of the fine sand and slag and had the following specified gradation:

Passing ¾-inch mesh and retained by ¾-inch mesh.....	0-5 per cent
Passing ¾-inch mesh and retained by No. 4 sieve.....	25-50 per cent
Passing No. 4 sieve and retained by No. 100.....	30-45 per cent
Passing No. 100 sieve.....	1-15 per cent
Asphalt.....	4.5-6.5 per cent



C. & E. M. Photo
The set-up of the 90-ton Warren Bros. asphalt plant which supplied hot-mix material for repairs by state maintenance forces near La Place, La.

Organization

The organization required for the operation of this plant by Asphalt Materials Co. of Baton Rouge, La., included three to five men unloading the aggregate from the cars, four men wheeling the aggregate to the cold elevator when running base or binder material, one fireman to tend the boiler and the burner, one mixer man operating the asphalt weigh bucket, one man stacking the material in the trucks, and one elevator man. L. A. Lacour was Plant Superintendent for the Asphalt Materials Co.

A. V. La Bue was Plant Inspector for the Louisiana Department of Highways. The work was done under the direction of W. S. Guedry, District Engineer, Hammond, La., with J. B. Landry as Resident Engineer.

Sixty Years of Service

Celebrated by Keystone

The Keystone Driller Co., Beaver Falls, Penna., manufacturer of power shovels and various types of drilling machines, is this year celebrating its sixtieth anniversary. Starting in 1882 as the Keystone Portable Steam Driller Co., this firm began by manufacturing well drilling machines, and since that time has steadily progressed and added to its line of equipment.

A series of new bulletins, covering the Keystone crawler-mounted blast-hole drills, various types of well drills, clean-out machines, and a new well-drilling tool catalog, have recently been issued. Copies of these bulletins and catalog may be secured by those interested direct from the manufacturer.

REPLACEMENT PARTS

for
**Caterpillar
Tractors**

Sprocket and idler rims . . . Track rollers, shafts, end collars, washers and bushings . . . Track pins and bushings . . . Springs . . . Clutch parts and many others . . . Ready for immediate shipment . . . Write for our catalog.

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OVER THIRTY YEARS OF DEPENDABLE SERVICE

KEEP OUR VITAL ROADS OPEN



"SPRAY MASTER" PRESSURE DISTRIBUTOR



"TANKAR" HEATER



ROAD BROOM



SUPPLY TANK

Let's "Keep Them Rolling" on our vast highway system without delay. Construct and maintain Black Top Roads the modern way, with Littleford Black Top Road Equipment. Littleford Pressure Distributors, "Tankar" Heaters, Supply Tanks, and Road Brooms are the units that save operating time, and lower the cost of the job. Use designed Road Equipment — Littleford Equipment.

Send for New Catalog "R" on Road Constructing & Maintenance Equipment.

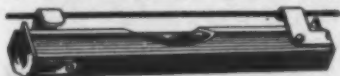


LITTLEFORD

Littleford Bros., Inc.

485 E. Pearl St., Cincinnati, Ohio

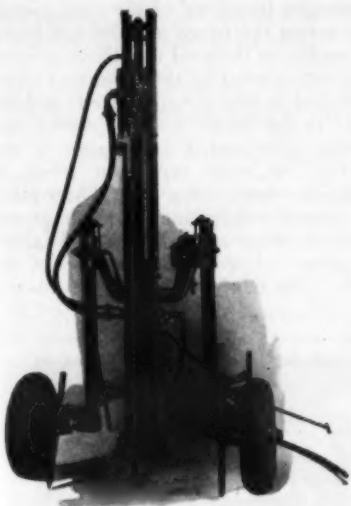
**SAND'S-STEVEN'S
Line & Surface LEVEL**



Endorsed and Adopted by Road Builders and Contractors

Level is easily and quickly attached to line. Special feature construction prevents accidental detachment from line. Construction is sturdy, and accuracy guaranteed.

SAND'S LEVEL & TOOL CO.
8531 Gratiot Ave. Detroit, Mich.



The Ingersoll-Rand X-71WD drifter with wagon-drill mounting.

Wagon-Drill Mounting For New I-R Drifter

A drifter has been developed by Ingersoll-Rand for wagon-drill service in which the drilling of deep holes is usually a prime requirement. The new features of the X-71WD Drifter include a positive method of blowing which directs more blowing air through the drill steel with very little air escaping around the sides of the shank. This is considered a major improvement since it virtually eliminates the wastage of air and directs a strong steady current to the bottom of the hole where it is needed for cleaning.

The new X-71WD has a longer stroke and a heavier piston which provide the strong rotation and striking force necessary to overcome the inertia of a heavy drill steel, and also permit the use of larger bits.

More detailed information will be furnished promptly by Ingersoll-Rand Co., 11 Broadway, New York City, to those mentioning CONTRACTORS AND ENGINEERS MONTHLY.

Gasoline Rationing Cuts Traffic in Two

There has been a sharp decline in highway traffic in Atlantic seaboard states since gasoline rationing went into effect, according to early scattered counts by highway departments in eight states. Travel on roads to recreational areas showed the greatest effect of rationing. Only about one-third as many cars, for example, used the Merritt Parkway in Connecticut each of the first two Sundays after gasoline rationing, as compared with the corresponding Sundays one year ago. Traffic volume for the first full week after rationing was about 40 per cent of the corresponding week last year.

Reports from Maine, Connecticut, Rhode Island, New York, Pennsylvania, New Jersey, and the Carolinas indicate that total traffic on rural roads the first two full weeks following rationing was 55 to 65 per cent of the volume the corresponding week a year ago. Public Roads Administration officials report that cars on U. S. 13 and U. S. 40, immediately north of their junction in Delaware, show that not only are fewer automobiles traveling, but they are making shorter trips. Fifty-three cars with Delaware license plates were found on May 21, 1942, for every 100 that appeared in 1941, but only 27 with out-of-state plates were noted for every 100 counted last year. Total traffic at night after 10 o'clock was 90 per cent of that a year ago, probably due to heavy motor freight movements.

Total traffic on rural roads, while greater in January, 1942, than in January, 1941, has steadily declined since tire rationing became effective. The 1942 percentages of 1941 traffic for

successive months were: January, 101 per cent; February, 92 per cent; March, 89 per cent; and April, 85 per cent. On the other hand, throughout 1941, traffic volume increased steadily, totaling about 112 per cent of 1940 traffic, based on continuous records of nearly 600 permanent automatic traffic counters in operation on roads throughout the country.

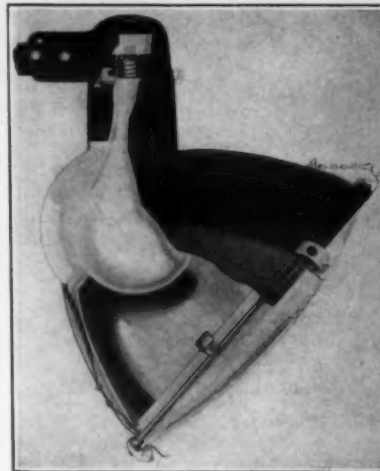
Report on motor-fuel tax receipts in 29 states scattered throughout the country, and including many outside the gasoline rationing area, in April indicate that the consumption of motor fuel is still about 95 per cent as great as it was one year ago. PRA officials explain that this indicates that while rural traffic is declining, urban traffic has increased. It is also an indication of the fact that where gasoline is plentiful there is not the urge to conserve tires on the vast volume of new cars bought last year nor on older cars which were completely re-equipped with new tires last year.

Buy U. S. War Bonds and Stamps.

Floodlighting Jobs By Effective Beams

A new series of wide and narrow beam floodlights designed especially for lighting shipyards, construction projects, and industrial areas, has been announced by the Westinghouse Electric & Mfg. Co., Lighting Division, Edgewater Park, Cleveland, Ohio. Both the new VE-18 wide-beam and the VEG-18 narrow-beam units are equipped with a snap cover having a heat-resisting glass lens, making them dust-tight and moisture-proof to prevent the accumulation of dust and dirt on the reflecting surface. A choice of narrow-beam glass reflector or wide-beam porcelain enamel reflector, with various lenses and lamp combinations from 750 to 1,500 watts, provides a complete range of beam spreads.

The reflector housing is formed from annealed sheet iron with a green porcelain enamel finish. The VE-18 unit has a white porcelain enamel inside surface, while on the VEG-18 the forward elliptical section of the reflector is a separate



One of the new Westinghouse floodlights.

piece of silvered glass, and the rear section is white porcelain enamel.

Complete information and prices may be secured direct from Westinghouse at Cleveland.

CHARGE It the Easy SMITH Way!

Select either Feed Chute or Batch-hopper for Faster and Easier Loading.

Handy FEED CHUTE

5 1/2 cu. ft. BATCH HOPPER

3 1/2-S

SMITH TILTER

—the ONLY small tilter equipped with a feed chute, 31" wide and only WAIST HIGH, it provides a big roomy target for the shovel man.

STEP UP CONCRETE PRODUCTION with a Smith 5 1/2 foot Gated Batch-hopper. Enables you to get one batch ready while the previous one is being mixed and discharged. Speeds up the job materially.

MORE FOR YOUR MONEY — Convenient loading — "End-to-Center" mixing action — faster "Tilt and Four" discharge. You get them ALL with a Smith 3 1/2-S, yet you pay very little more. Write for literature.

THE T. L. SMITH COMPANY
2857 N. 32nd St. Milwaukee, Wis.

SMITH MIXERS

THE BOULDER DAM MIXERS

TRAIL-SMITH

7-S or 10-S

Spring-mounted axle — Roller bearing auto type wheels — Oversize low pressure pneumatic tires — Automatic skip vibrator — Enclosed gear reduction — Multiple V-belt drive — Vertical siphon-type tank.

BUILT TO "TAKE IT" — either on the job or traveling between jobs. Compact. Lightweight. Roller bearings throughout. Also 4 wheel end or side discharge models. Other sizes 2 1/2-S to 112-S. Write for literature. THE T. L. SMITH COMPANY 2857 N. 32nd Street Milwaukee, Wis.

Tows behind car or truck at fast driving speeds!



MIXER MANUFACTURERS FOR MORE THAN 40 YEARS

ANNOUNCING—



the new

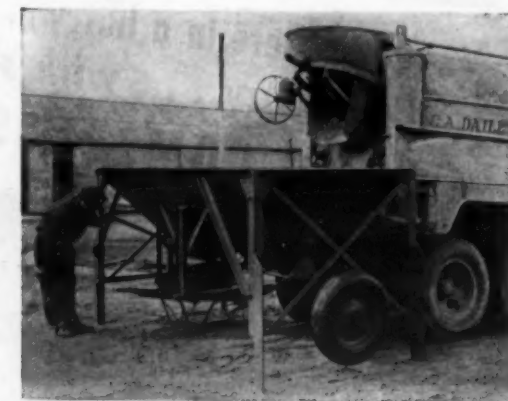
BUTLER PORTABLE CONCRETE HOPPER

• More concrete with fewer truckmixers. On many jobs save up to a half hour per truck per trip.

• Two-wheeled design is more stable than three-wheeled type, more maneuverable than any.

• Standard 6.00 x 16 tires (or 6.50 x 16) can be secured second-hand anywhere. Light load permits old, worn tires to be used.

• Easy one-man erection. Hopper is ready for use in a few minutes —only one lift of an ordinary automobile jack for erection.



• Low headroom. Dumping height is only 62" for two-yard hopper with telescoping legs adjusted to 24" buggy clearance.

• Convertible capacity enables one hopper with extensions to be used with 2, 3, 4, or 5 yard truck mixers.

Write for Literature Today

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN



C. & E. M. Photo

Remember when? The dowel and reinforcing-steel assembly at an expansion joint on a Nebraska concrete paving job.

Fine Grade and Forms On Nebraska Highway

(Continued from page 18)

below. As soon as the trap was down, the man stepped off and helped the two men dump the barrels of cement on the batches and then, using a tackle, lifted the trap to clear the truck. An extra man rolled the empties to one side ready for reloading on the flat-bed truck which hauled the drums from the railroad siding. After the aggregate batches had been weighed on the Howe scales of the Blaw-Knox batching plant and delivered to the batch truck, the truck was stopped just before it reached the cement dock where one man shoveled the batch to the side to leave a hole for the cement, and then after that was delivered another man beyond the cement dock covered the cement with the gravel.

The aggregate used was a Class A sand-gravel, making one aggregate for the concrete batch. It had the following screen size specifications:

Retained on No. 4.....	10-55 per cent
Retained on No. 10.....	45-70 per cent
Retained on No. 20.....	60-85 per cent
Retained on No. 30.....	75-95 per cent

The batch weight consisted of 3,219 pounds of sand-gravel and 724 pounds of cement for a 1.1-cubic yard batch, and the total water added above the dry weight was 40 gallons per batch. The weight of sand-gravel given was the weight including moisture.

Fine Grade and Forms

A Caterpillar D8 and a 10-yard Le-Tourneau Carryall were used to take out the material on the grade after it had been scarified ahead of the forms. Then a Caterpillar No. 11 power grader and a Caterpillar No. 20 leaning-wheel grader, as well as an R5 with a rotary scraper, cleaned up the grade in quick time. The tractor used with the Carryall scraper was equipped with a heavy U-shaped bar immediately in front of the operator and over the controls which provided a handy support for the operator in rough going and particularly when he had to turn to operate the levers for his cable-controlled equipment. After the grade was prepared to approximate subgrade elevation, the subgrade was scarified to a depth of 6 inches and if necessary water was added to the soil to bring the moisture content to within 3 per cent plus or minus of the optimum moisture for that particular soil. Then the subgrade was compacted to a relative density which was not less than 90 per cent of the maximum by the Proctor method. Just ahead of the form-setting gang a Ted Carr form trencher cut the thickened edge and subgrade foundation for the Blaw-Knox 9-inch forms used on the 9-7-9-inch slab which was poured 20 feet wide.

Immediately behind the form-trench machine, six men cleaned the trench and trimmed it to line, and two form setters with two helpers lined up the forms, with one man tamping base ahead of the R-B power Finegrader. Three men worked behind the machine cleaning up the fine grade and three others tamping forms while a fourth oiled them. A Huber 5-ton three-wheel roller gave the final compaction to the fine grade.

The Joints and Steel

The steel for the concrete slab consisted of dowel assemblies for the contraction joints and expansion joints, welded fabric and tie dowels across the center joint. The expansion joints were set every 120 feet with the contraction joints every 40 feet between. The expansion-joint dowel assembly consisted of two sections of eight dowels 28 inches

long and 3/4-inch diameter round bars tied to 1/2-inch round deformed rods, two on one side of the joint where the dowels were not greased and one on the greased side which has expansion cups on the end. The contraction joints were the same, except that the dowels are 24 3/8 inches long and there are no caps. The contraction joints were set in two sections each 10 feet long, the steel men using a piano wire with a long coiled spring inserted in it to hold it tight when it was clipped over the forms at marks previously placed. This insured

a straight lining up of the steel assembly across the forms and did not break as readily as the cord usually employed. The setting joint for the expansion joints included a heavy cap locked at both ends to the forms with set screws and double pins and a cross piece at the center. At each expansion joint, in addition, there were eight "hair-pins" or corner reinforcing bars set at the same elevation as the dowels and fabric, 3 inches below the top surface of the slab. The fabric was placed in mats 9

(Concluded on next page)

**250 LINEAR FT. per HOUR
of 25 FT. SLAB (MINUS 1" SLUMP)
9"-6"-9" THICK**



with this JAEGER Screw SPREADER



and this JAEGER Type "H" FINISHER

Ferry & Pearson Laid Up to 135 Cu. Yds. an Hour.
AVERAGED OVER 120 Cu. Yds. an Hour, Day
after Day, on Muroc Bomber Range, California

Record-Breaking Production of Denser, Smoother Slab—Fewer Men

On U. S. airport, near Ft. Wayne, James A. McKay & Sons report Jaeger Spreader-Finisher team was absolutely necessary to handle the very dry concrete in 25' width.

On 86 miles of 20'-24' slab, Koss Constr. Co. used 4 Screw Spreaders, report all engineers highly pleased.

On Ford's Willow Run Bomber Plant, 4 Jaeger Finishers placed 63 miles of 20' slab in 42 days.

On Higley Airport, Jaeger Team placed 362' per hour of 1 1/2" slump concrete 12'6" wide without labor in front of machines and no trace of segregation.

Saved 3 to 5 men behind 34E dual paver, reports C. H. Atkinson Paving Co., Missouri.

On Pennsylvania Turnpike Adam Eidemiller did 5160' in 14 hours, Tri-State Engr. averaged 4000 sq. yds. daily on 167,000 sq. yd. contract.

Spreader, equipped to both spread and finish, laid up to 150 tons hourly of bituminous resurfacing for Barber Construction Co., Chicago.

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THE JAEGER MACHINE COMPANY
701 Dublin Avenue, Columbus, Ohio



**You're in there in a hurry... and
out in a hurry... with speedy
LE ROI COMPRESSORS**



High mobility — on the road between jobs, and in moving about on the job site — is just one of the basic features which have made Le Roi Compressors so popular in the construction industry. Truck-type springs, cushioned towing eye protect against road shocks. Built by the only manufacturer who makes both engine and compressor. Le Roi-pow-

ered with heavy-duty valve-in-head engine—easily accessible for adjustment and quick, less costly repairs. Le Roi Compressors help you to make good with on-time performance on emergency construction... Write for information describing models available under present restrictions.

LE ROI COMPANY
MILWAUKEE • WISCONSIN
C-12

Pouring and Curing Nebr. Concrete Paving

(Continued from preceding page)

feet 6 inches wide and 13 feet 11 inches long, providing 45 pounds of reinforcing per 100 square feet of slab.

From Paving to Curing

The contractor used from nine to fifteen 2-batch trucks, of which nine were owned by the contractor and the remainder hired locally. They drove down the grade between the forms, over the ramp of the R-B Finegrader, then were reversed on a Blaw-Knox turntable, and backed to the paver. At the Koehring 27-E paver, one man tripped the batches and cleaned the body with a scraper to insure complete delivery of the cement. The batches were mixed for one full minute in the drum, giving an average 72-second cycle. The paver pulled a trail grader on which all of the available steel men and puddlers jumped whenever the paver was moving ahead in order to give a maximum load for cutting the hard subgrade. One man with a hand tamper pounded out the crawler marks left by the tractor and two men cleaned up against the forms and ahead of the trail grader, while another sprinkled the subgrade ahead of the paver in an attempt to soften it and also to provide the moisture necessary to prevent removal of water from the concrete by the subgrade when the slab was poured. The planer carried boxes for the pins, reinforcing bars and dowels used in setting the hairpins and tie dowels. The tie dowels are 4-foot x 1/2-inch round deformed bars placed at mid-depth of the slab on 5-foot centers.

This job had two men making up the steel assemblies for the expansion joints ahead, two men setting the dowel bars and the joint assemblies on the road and two puddlers on the bottom lift and four on the top, with a vibrator man to take care of the mechanical vibration of the concrete along the forms and at all of the joints. The slab was struck off by a screed pulled by the power winch on the paver, and immediately following this two of the puddlers at the screed carried in the reinforcing fabric and placed it on the concrete at the proper depth.

Finishing operations were started by the Blaw-Knox two-screed finishing machine on which were mounted two Bailey mechanical vibrators on pivoted stands. At the ends of the front section of the finishing machine were pipe holders for the vibrators when not in use. The center-joint cutter was mounted on the rear of the finishing machine and was pushed down into the concrete on the second pass of the finisher over the surface. Immediately behind this came a double rolling bridge with two men using a 12-foot wood bull-float which was stored on a narrow platform at the right-hand side of the bridge, while the "gun" or setting device for the center strip was kept on the left-hand side with the master steel-channel straight-edge for checking the 10-foot wood drag straight-edges used by the finishers. In a box at the rear of this bridge was a supply of the filler strips for the center joint. The two men on the bull-float worked together in setting the center strip, and a third man who helped push the double bridge ahead inserted the strip material in the gun. Both of the bull-float operators hand-floated over the center strip as soon as it was set.

Two four-legged "jumpers" were carried for setting on the forms in order to carry the strike-off over the expansion joints. One of the most important men on the job, who had as many calls for his services as Gunga Din, was the water boy, for the amount of real exer-



C. & E. M. Photo

High-pressure water was delivered 7 miles by this battery of triplex pumps on the Dobson & Robinson job between Seward and Lincoln, Nebraska.

cise a man gets on any part of a concrete job and with temperatures running up around 100 degrees water is an essential part of man's diet. The water boy on this job bossed four covered cans of water, each holding 5 to 10 gallons.

The hand-finishing operation started with two men using 10-foot drag straight-edges followed by a sawing action with an 8-inch canvas belt after which a second pair of 10-foot wood drag straight-edges were used and a second 8-inch canvas belt pulled over the surface.

Two boys on each side hauled concrete back from the mixer in rubber-tired wheelbarrows. They needed to be antelopes to navigate the unusually uneven grade which varied as much as 3 feet in elevation in places. One boy wheeled the barrow and the other pulled with a hook, and they were lucky when there was no spill between paver and lip curb. Lip curb is used in Nebraska wherever the grade exceeds 1 per cent and is built 3 inches high, 3 inches wide

at the top, and feathered out to meet the pavement at 12 inches from the side. The two boys hauling concrete set the curb forms and shoveled the concrete into place after which it was built up and finished by one man who used a sheet metal mule to get the final finish and then dragged burlap over the top and edged against the forms. Back of this operation came the joint finisher on a four-wheel single bridge pulling the caps and edging the joints.

At the very end of operations came a rolling bridge of wet burlap which was placed over the slab as soon as the surface water had disappeared. The contractor maintained two teams and flat rigs for hauling the steel forms ahead after eight men in the form-pulling gang had stripped them.

Personnel

The work described was done on the west end of a string of projects bearing the numbers 128A & B (4), 201A & B (1) and 225-3. The contract for this

work was awarded to Dobson & Robinson and Abel Construction Co., of Lincoln, Nebraska, jointly. Ira Hill was Superintendent for Dobson & Robinson and J. B. Harris was Project Engineer for the Nebraska Department of Roads and Irrigation.

Welding in the War

When the war began, welding was a full-grown process, ready to step in and do its job. It is safe to say that welding in all its multitude of uses has done more to speed the war program than any other development. Its use has saved the government more man-hours than any other development, with the possible exception of the airplane, and welding has helped make that possible too.

Free Bulletin

HOW TO
MAKE YOUR
CONSTRUCTION
TIRES LAST
LONGER

Tells You How to Make CONSTRUCTION TIRES LAST LONGER

Your contractors, servicemen, mechanics and operators looking for ways to make your construction equipment tires last longer will get plenty of helpful ideas from this new bulletin, "Stretch Your Tires." It's prepared specially for you. You get factual dope on:

Recommended tire pressures over a full range of working conditions for all Le-Tourneau Carryall Scrapers (current and older models), Cranes, Tournapulls, Tournatrailers and Tournacranes . . . Tire-conserving operating hints . . . Proper tire upkeep and repair . . . Haul road maintenance . . . Recommended tire tools, accessories, etc.

Write NOW for your free copy, or for as many bulletins as you will need. It will pay you in the long run, by keeping your tires and equipment rolling longer for Victory!



Send this Coupon TODAY

Gentlemen:—

Please send me FREE.....copies of "Stretch Your Tires."

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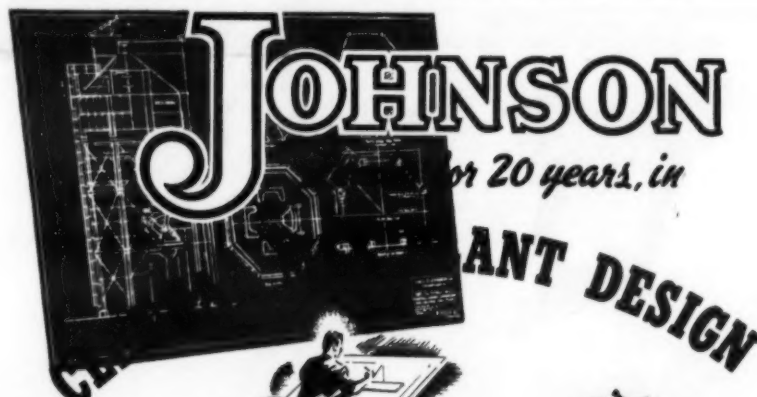
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MAXIMUM SAVINGS IN TIME, LABOR, AND MATERIAL go with operation of a JOHNSON CENTRAL MIX PLANT. ONE MAN OPERATION AND FASTER BATCHING TIME—assure positive operating economy.



CONCENTRIC AGGREGATE CEMENT BATCHING—aggregate and cement intermingling, during discharge operation, assure 20% pre-mixing and pre-shrinkage—eliminates mixer gumming.

CEMENT STORAGE IN CENTER OF AGGREGATE BIN—affords centralized control operation and greater accuracy. Cement scale and hopper is suspended within aggregate scale and hopper.



STEP BY STEP CONSTRUCTION—small, portable plants, for use with bag cement, are so designed that capacity may later be increased and bulk cement installed without costly change or delay.

BUILT FOR ANY TYPE BIN CHARGING METHOD—

C.S. JOHNSON CO.
CHAMPAIGN, ILLINOIS

MANUAL-SEMI-AUTOMATIC OR FULL AUTOMATIC CONTROL IS AVAILABLE ON ALL JOHNSON CENTRAL MIX PLANTS.

ELEVATORS · CONVEYORS
ROADBUILDERS' EQUIPMENT
SILOS AND STORAGE BINS



Hot asphalt being poured on the 3 x 12-inch transverse decking before "floating" the longitudinal decking on a bridge in Fresno County, Calif. This "sealed" wood deck construction, developed and used by Fresno County for the past six years, minimizes decay between the double decking.

New Type Wood Deck For County Bridges

Longer service life and greater load capacity are two advantages claimed for the system of wood deck construction developed and used with pressure-treated stringers during the past six years to cut maintenance costs for bridges in Fresno County, California.

Seven miles of wood decking, surfaced with asphalt, serve the general traffic and trucks carrying agricultural products in this great fruit-growing section. There are about 7,000 structures on the county system.

"Decay was the major factor, aside from mechanical wear, which shortened our service records for deck material," Surveyor Edgar C. Smith, in charge of Fresno County's bridge program, reports. "To stop the fungus of dry rot from doing damage between the deck layers, which is the spot most vulnerable to attack by decay, we build our new decks by floating the top longitudinal decking into place with Grade E asphalt, literally sealing it to the bottom transverse decking."

Another safeguard against decay is set up by resting the decking on Wolmanized 4 x 16-inch Douglas fir stringers. Mr. Smith reports that untreated stringers with redwood abutments last about 20 years, and with their present system of using concrete for abutments and pressure-treated stringers it is expected that the decks will last at least 30 years.

The use of treated stringers has also proved effective in combating attack by termites. A gradual spread of subterranean termites northward from southern California was first noticed in Fresno four years ago by a member of a maintenance crew. Investigation of an untreated stringer disclosed that termite activity had progressed upward into the deck. No termite damage has been discovered in wood bridges and culverts built with Wolmanized stringers which, plus the use of creosoted and steel H piling, combine to form an effective barrier, blocking termite passage into the superstructure.

Fresno County bridges are designed for standard H-12½ loading, but by se-

curely nailing the bottom floor to the stringers and cementing the top floor to the bottom floor with hot asphalt, Mr. Smith believes that a partial T-beam action is secured, which makes the deck equivalent to an H-15 loading. There are about 500 bridges in the county built in this manner. Inasmuch as not more than a dozen broken stringers have been found, Mr. Smith's theory of the T-beam action would seem to be upheld.

New Catalog on Scales

A new 16-page condensed catalog covering its line of dial scales and war engine-testing equipment has just been released by the Kron Co., Bridgeport, Conn. Kron industrial dial scales are

all of the springless type, actuated by compensating pendulums, and include a wide variety of types for use in weighing and batching all types of construction materials.

The war engine-testing equipment includes dynamometer scales, fuel-consumption testing scales for diesel and gasoline engines, lubricating-oil consumption and oil-flow testing scales for engines.

Copies of this new Kron catalog may be secured by those interested direct from the manufacturer.

Maintenance Handbooks For Thew Shovel Users

The recent WPB order restricting the manufacture and sale of power shovels and cranes, except with WPB approval, means that the power shovels and cranes now in the field must go on doing their jobs at top speed and performance. These machines will do just that, if they are properly lubricated and maintained.

Two valuable handbooks, describing the care, operation, adjustment, lubrication and application of Thew-Lorain shovels and cranes, designed particularly to increase their service life and prevent breakdowns, through proper care, are put out by the Thew Shovel Co., Lorain, Ohio, for Thew-Lorain shovel and crane owners and operators.

One of these handbooks covers ¾ to ¾-yard crawler units and Moto-Cranes, and the other, 1¼-yard and larger Lorains. Copies of these books are available only to Thew owners and operators, and may be secured direct from the Thew Shovel Co. by sending to it the name and address of the owner of the machine, the model, and the serial number of the unit or units.



GAR-BRO CONCRETE METHODS

This contractor is using a GAR-BRO lightweight bucket and attached accordion hopper to place concrete in narrow wall forms! This combination handles easily on any rig . . . and can place concrete in a teacup! Notice how hopper folds under bucket for lowest loading height. (Inset)

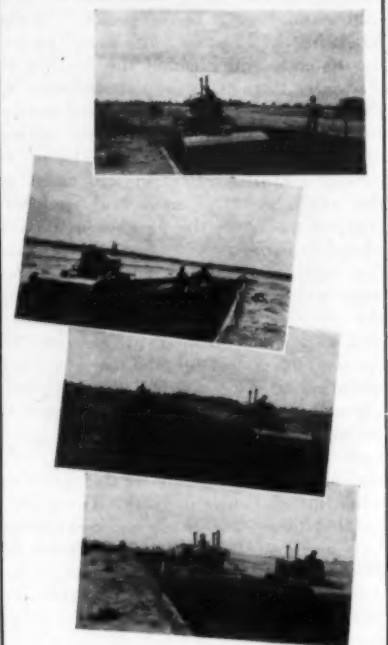
Arnold Machinery Co., SALT LAKE CITY • Edward R. Bacon Co., SAN FRANCISCO • Conley-Lott-Nichols Machinery Co., DALLAS • Contractor's Equipment and Supply Co., ALBUQUERQUE • A. H. Cox & Co., SEATTLE • R. H. Everett & Co., HOUSTON • Intermain Equipment Co., MOBILE • Loggers and Contractors Machinery Co., PORTLAND • F. W. McCoy Co., DENVER

Manufactured and Sold by Garlinghouse Brothers, Los Angeles

THE MOST IMPORTANT UNIT FOR AIRPORT RUNWAY CONSTRUCTION



Wherever there is mixed-in-place construction such as soil-cement, bituminous, etc.



IT DOES THE JOB THOROUGHLY, RAPIDLY, AND ECONOMICALLY

The AGGMIXER operates with other general purpose road equipment—from power take-off shaft of any suitable tractor—easy and safe to operate. The swirling chopping action of the AGGMIXER tines does a thorough job of mixing—wet or dry. Illustrations above show use on airport runway construction. Send for job facts now.

**ARIENS COMPANY,
BRILLION, WISCONSIN**

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Enclosed is my remittance of \$2 for the next twelve issues of CONTRACTORS AND ENGINEERS MONTHLY.

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Carey Elastite EXPANSION JOINT
Standard in Concrete Construction for 26 Years
ECONOMICAL and EFFICIENT
Architects' Joint • Builder's Joint
New Extruding Expansion Joint
Plate Dished Expansion Joint
Sub-grade Joint
THE PHILIP CAREY MFG. CO.
Inexpensive Products Since 1873
LOCKLAND, CINCINNATI, OHIO

What It Takes to Make Good Road Engineers

(Continued from page 36)

varied and sundry ways and purposes for which the engineer and the contractor may use the materials he passes on to them. He may give them an excellent concrete aggregate which fails utterly in asphaltic concrete. He may give them a perfectly good MC-5, insofar as specifications are concerned, which in actual construction fails to give as good a prime as it should.

Seriously, the Materials Engineer has many problems, and many faults, the chief of which is becoming lost in the deepness of theory and thereby losing sight of the practicability and the applicability of the problems confronting highway engineers.

There are at our disposal many volumes on the study and research of asphaltic cement relative to its part in pavement failures. Yet all of this laborious study has been given to asphalts in certain pavements which have failed, without enough thought given to the aggregate, the filler, the workmanship, and the climatic, atmospheric and soil conditions. How can we possibly hope to prevent the repetition of a failure by studying only one ingredient, and without the actual knowledge of the cause of the failure?

The Materials Engineer should, therefore, study the pavement as a whole, not just one ingredient or just one step; he should remember that a "scientific mind" is necessary in the laboratory, but that a "practical mind" will build the road; and, therefore, he should see that his specifications or tests are practical and actually have some field correlation.

New 5-KW Generator

The new 5-kw generator recently announced by the Kato Engineering Co., Mankato, Minn., is of the revolving armature type and can be connected for either 110-volt or 110/220 three-wire service. It is also available for three-phase three-wire and three-phase four-wire service, the latter permitting the operation of three-phase equipment and also single-phase equipment by connect-

ing from the fourth wire to any one of the three-phase wires, the usual voltage combinations being 208/120 or 220/127.

These generators are said to have good motor-starting capacity, including the surplus capacity necessary for starting repulsion induction-type motors. All ac and dc brushes are easily accessible for inspection and adjustment. Bearings are sealed with sufficient lubrication for their life under normal operating conditions. The bearing housings, however, are drilled and tapped to permit additional lubrication if necessary.

Complete information on this new 5-kw generator, as well as on the complete line of Kato ac and dc generators ranging in sizes from 350 to 15,000 watts, in both 1,200 and 1,800 rpm models, may be secured by those interested direct from the manufacturer by referring to this item.

Absorptive Lining For Concrete Forms

The vibration or compaction of concrete causes the formation of countless air and water bubbles which are drawn to the face of the concrete. When ordinary wood forms or non-absorptive form liners are used, these air and water bubbles can find no place to escape and the stripping of the forms discloses the face of the concrete pitted with unsightly voids.

To provide a smoother concrete surface, the Fir-Tex Insulating Board Co., Porter Bldg., Portland, Ore., has developed the Fir-Tex absorptive concrete form liner. This is a highly absorptive felted board $\frac{1}{2}$ inch in thickness made by a special process with a chemically treated surface which resists bonding. This form lining has been used on such projects as Friant Dam in California, Parker Dam on the Arizona-California border, Cherokee Dam, Jefferson City, Tenn., Rock Springs Viaduct built for the Wyoming State Highway Commission, and many other smaller structures such as bridges, grade separations, and retaining walls.

A 4-page folder, describing Fir-Tex absorptive form liner, giving instructions for its use, and containing photographs illustrating comparative tests made by the Bureau of Reclamation, may be secured by interested contractors and engineers direct from the manufacturer by mentioning this item.

Protective Clothing

A full line of workers' protective clothing, including gloves, goggles, hand protectors, welders' aprons, chaps, leggings and other items, is made by the Olympic Glove Co., 95 Madison Ave., New York City and described in its

Catalog 11A.

Safety on the job and the avoidance of accidents have never been more important than they are today when every man-hour is vital to Victory. Provision for the proper protective equipment will keep men safety-conscious and on the job.

In stock at New York, Philadelphia, Baltimore, Atlanta, Hartford, Richmond, Charlotte and Los Angeles

GEORGE HAISS MFG. CO., INC., Canal Place & East 142nd St., NEW YORK
DISTRIBUTORS EVERYWHERE



WORKING UNDER PRESSURE

Every day—almost every hour—brings new problems in the war production program. More and more goods must be turned out—often with less material to work with. Almost every manufacturer has the job of coming through on time so that other war industries are not thrown off schedule.

That takes plenty of sweat in the shop and constant good planning by the management. Ingenuity and resourcefulness are at a premium as never before—for America is again showing its native genius to solve the impossible problems almost as fast as they arise. This is the way the war will be won, and even though it entails temporary sacrifices, it is a small price to pay for Victory.

From Factory Bulletin Board of the
CONTINENTAL RUBBER WORKS
MADE IN THE ITALIC (ONE TON) RUBBER
PA, U.S.A.

THE HAND OF THE SPECIALIST IS OFF
REVEALED IN LITTLE THINGS
*of BIG importance

MALL TOOL COMPANY
7741 SOUTH CHICAGO AVE. CHICAGO, ILL.
Offices and Distributors in Principal Cities

Avoid Legal Pitfalls

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Edited by A. L. H. STREET, Attorney-at-Law.

Don't Substitute Oral For Written Notices

There is a simple formula for avoiding a common type of lawsuit that arises under construction contracts, but there is an amazingly widespread disregard of its use. The formula is merely this: If the contract requires a written notice to be given within a stated time, do not rely upon an oral notice or a belated written one.

An object lesson lies in a decision rendered by the United States Court of Appeals for the District of Columbia, in the case of *United States v. Cunningham*, 125 Fed. 2d, 28.

Uncle Sam, who is a stickler for technical adherence to contract terms, awarded a bridge contract. One clause of the agreement specified that, if the contractor should be delayed in doing the job, he must give ten days' written notice of the cause, as a basis for determining responsibility, his right to damages or extended time, etc.

The contractor was delayed by the Government's delay in furnishing alignment points and a bench mark at the site. He gave oral, but no written, notice. The court said that thereby he gave the Government a valid defense against his subsequent claim for damages suffered by reason of the Government's delay.

The court noted that there was a dearth of court precedents on the effect of an oral notice as being a substitute for written notice, as applied to causes of delayed performance. But the court cited several appellate court decisions on the point that "in cases involving a provision requiring a written order for 'extra work', it is almost universally held that a verbal order is insufficient."

Taxation of Contractors On Federal Construction

A Minnesota contracting company repaired a jetty at the mouth of the Columbia River, within the boundaries of Oregon, for our Uncle Sam. The Oregon Tax Commission assessed a tax on the profits made by the company. The company did not think that the State was paying proper respect to Uncle Sam by trying to muscle in on the profit he allowed the company for doing the work. That's how the case of *Winston Bros. Co. v. Galloway*, 121 Pac. 2d, 457 happened to be born. Upholding the validity of the tax, the Oregon Supreme Court said:

"It is well settled that title to the bed of a navigable stream, within the boundaries of a state, is vested in the State. Such title, however, is, among other things, subject to the paramount right of the United States Government to construct a jetty thereon in aid of commerce and navigation. It was not necessary for the Federal government to obtain the consent of the State to build the jetty. It does not follow, however, that, because the Federal government had exclusive authority over the construction of the jetty and is the owner thereof, the State of Oregon was ipso facto divested of its jurisdiction to levy a tax on the net profits of a corporation derived by carrying on such work."

The court cited decisions of the highest court of the land as supporting its conclusions.

Construction Executive Deemed Not an "Employee"

While driving a construction company's car on a business errand for the corporation, the president, who also was one of the two principal stockholders, was fatally injured. His widow attempted to enforce a workmen's compensation claim against the company, under the North Carolina Workmen's Compensation Act, on a theory that he was an "employee" of the company. One of the lower courts of the state decided that an award was proper, but the decision was set aside by the North Carolina Supreme Court on appeal. (*Gassaway v. Gassaway & Owen*, 18 S. E. 2d, 120.)

It appeared that the decedent had checked prospective jobs, made estimates, figured bids, supervised construction, etc. It also appeared that occasionally he took a hand in manual work.

"We adhere to the dual-capacity doctrine under which executive officers of a corporation will not be denied compensation merely because they are executive officers if as a matter of fact, at the time of the injury, they are engaged in performing manual labor or the ordinary duties of a workman," declared the court.

"To come within the doctrine, it is not sufficient to show that an executive officer sustained injuries while performing manual or mechanical labor, which was no part of his duties. . . . Nor are desultory, disconnected, infrequent acts of manual labor performed by an executive sufficient to classify him as a workman, when so engaged. . . . The test is,

was he at the time of his injury, as a part of his duties, engaged in performing ordinary, detail, mechanical or manual labor or other ordinary duties of a workman?"

Scope of Coverage of Public Contractors' Bonds

Does a bond obligating a public contractor to pay all bills for "labor performed," "services rendered," and "materials furnished," in the performance of his contract cover premiums on liability policies taken out by the contractor as required by the terms of the contract?

That question was answered in the negative by the Pennsylvania Supreme Court in the case of *City of Pittsburgh v. Parkview Construction Co.*, 23 Atl. 2d, 847. The court's opinion notes that the same answer has been given by the appellate courts of North Dakota, Delaware, Kansas, Oklahoma, Georgia, Wisconsin, Massachusetts, New Mexico, Arkansas and Indiana.

But the Pennsylvania Supreme Court decided that another bond was so worded as to require the payment of premiums, because it bound the contractor to "satisfy all claims and demands" incurred in, or growing out of, performance of the contract. Similar holdings appear in decisions of the courts of Maine, Wisconsin and New York.

Beating by Co-Employee As Compensable "Accident"

Where the water boy on a construction job was inexcusably assaulted and beaten by his foreman and a fellow employee, in a row that rose out of the work, the boy was entitled to a workmen's compensation award against the employer. So decided the South Carolina Supreme Court in the case of *Thompson v. J. A. Jones Construction Co.*, 19 S. E. 2d, 226.

The court noted that the compensability of such injuries under the workmen's compensation acts of the several states has frequently been passed upon by the courts and that the generally recognized rule is that, "although an employee be wilfully assaulted by another, whether fellow servant, foreman or outsider, the resulting injury will be deemed accidental and within the terms of compensation law when it can be said that the assault proximately resulted from the prosecution of the employer's business. . . ."

"While a wilful assault may be said not to be an accident so far as the aggressor is concerned, to him who is not the aggressor there exists the unexpected factor necessary to constitute an 'accident' as contemplated by workmen's compensation laws."

The court also observed that there is no common-law liability of an employer for injury in cases of this kind.

What Does "Rock" Mean?

A contract to construct a sewer in a "rock tunnel" did not imply that the construction would be through solid rock. Therefore the contractor was not entitled to extra pay for surfacing the tunnel where mud seams, clay pockets, and boulders complicated performance of the work. So decided the St. Louis Court of Appeals in the case of *Stiers Bros. Construction Co. v. Moore*, 158 S. W. 2d, 253. After quoting a dictionary definition of rock as being "a large concretion mass of stony

material," the court said:

"The whole subsurface material through which this tunnel was projected would fall within the general description of 'rock' as that term is defined above. When that fact is considered in connection with the notation on the plans and specifications expressly negating any guarantee or representation with respect to subsurface material between the bore holes shown thereon, and the other provisions of the contract, . . . we feel that the court properly held that there was no breach of warranty or misrepresentation."



TO HELP HASTEN VICTORY

From the very start of the war, Galion pledged full support . . . all our facilities now directly linked to war production schedules. We regret that we can not give 100% attention to your needs at present. For the duration extend the life of your present Galion machines.

THE GALION IRON WORKS & MFG. CO.
Main Office and Works: Galion, Ohio



Cut MIXING Costs

Low cost production is important and essential to the successful contractor. H & B Bituminous Mixing Plants, both portable and stationary types, are designed with this problem foremost in mind. That the solution has been found is evidenced in the large proportion of Hetherington & Berner equipment to be found on the job today.

Your Inquiries Are Solicited



Hetherington & Berner Inc.

ENGINEERS AND MANUFACTURERS

701-745 KENTUCKY AVENUE
INDIANAPOLIS, INDIANA



One of Wayne County's emergency crews in rehearsal for an air-raid alert.

Wayne County Ready For Emergency Work

Realizing its responsibility as a public works agency, the Wayne County, Michigan, Road Commission initiated preparations shortly after Pearl Harbor to make its resources available for any emergency, sabotage or bombings which might occur.

The emergency organization consists of fifteen fully equipped crews, each composed of eleven hand-picked men, all capable of doing the heavy work which might be required in an emergency. Each crew is provided with a large truck and a full complement of tools, such as shovels, picks, axes, saws, crow bars, rope, cable, red lanterns, fuses, warning signs, welding equipment, and the recommended first-aid equipment including stretchers and blankets. In addition, several hundred pieces of major equipment are available as needed, including trucks, tractors, cranes, power shovels, pile drivers, hoists, air compressors, bulldozers, pumps, portable lights, and similar equipment necessary to the repair or demolition of damaged structures. All pieces of equipment considered necessary for emergency work are marked with a large "E," and a constant check is kept on their location while engaged in their daily routine work.

All emergency workers are provided with standard identification cards or badges, and all have been trained in first aid. One of the emergency crews will serve as a gas crew, and is equipped with gas testing equipment and oxygen masks for rescue work. Operators of the major pieces of equipment for emergency service are particularly highly skilled workers, and all members of the crews were selected carefully for their skill and ability for this type of work.

To facilitate such emergency work, some sixty experienced engineers located at strategic points throughout the county will serve as emergency spotters. These men will immediately visit the scenes of any disasters and will then report to the central yard on the scope of the disaster and the type of emergency equipment needed. In the meantime, the crews would be gathered.

The County Road Commission believes that it has definite wartime responsibilities, and its organization is being coordinated with the civilian defense organizations throughout the county so that no time will be lost in meeting any disaster, so that damage done can be quickly repaired and more important so that lives can be spared.

Reduced Highway Budget In Kentucky for 1942-43

The recently announced budget of the Kentucky Department of Highways for the fiscal year ending March 31, 1943, is based on an estimated total revenue of \$13,663,525. Of this, \$6,000,000 has been allotted for maintenance, \$1,786,562 for construction, \$250,000 for reconstruction, \$250,000 for cooperative construction, \$2,000,000 for rural highways, and \$150,000 for the purchase of new equipment.

The figure for maintenance is the same as that for the preceding year, but the sum for construction is very much smaller than it has been for the past four or five years. The cooperative construction carried on by this Department is in cooperation with the Works Progress Administration and for which the State pays only the sponsor's portion of the cost. The item for rural highways under Kentucky statutes covers the construction, reconstruction and maintenance of designated highways exclusive of the state's regular state-maintained primary system. However, due to the conditions incident to the war, it is expected that this year's rural highway program will be confined entirely to the maintenance of existing rural highways.

In addition, the following Federal funds are available for construction: \$1,208,000 for access roads; \$1,339,000, regular Federal Aid, for the strategic network; and \$150,000 for the F-A secondary road system.

Fly-Ball Governors Adjust Engine Speed

To work any piece of construction equipment at maximum efficiency, the engine speed must be adjusted up and down to deliver greater or less power as required by the machine. To do this by hand is inefficient as there is always the lag due to the human reaction. This results in not enough power when the load builds up and a racing of the engine when the load is released. Pierce fly-ball governors, made by The Pierce Governor Co., Anderson, Ind., are so sensitive that when a shovel "bites the dirt" the governor almost instantly opens the throttle to take care of the load without any lag or extreme falling off in engine rpm.

Among the leading manufacturers standardizing on Pierce governors for engine-speed control are Barber-Greene, Marion Steam Shovel, Bucyrus-Erie, Le Tourneau and others. A complete description of the various designs of Pierce governors to meet the individual requirements of different makes and models of engines, both gas and diesel, will be found in the latest Pierce catalog, Form G-1008, which will be sent free to readers mentioning CONTRACTORS AND ENGINEERS MONTHLY.

Air-Compressor Bulletin

A new well-illustrated bulletin on Schramm Fordair compressors has recently been issued by Schramm, Inc., West Chester, Penna., from which copies may be secured by interested contractors and state and county highway engineers upon request.

Among the Fordair compressor models described and illustrated are the trailer types; skid-mounted types; the Tampair, a small highly portable unit for repair, maintenance and emergency service; the Trailbuilder designed for easy transportation over rough terrain; crawler and truck-mounted models; and two stationary models. The specifications for each type are given, as well as information about the various tools for use with these compressors.

New Weatherproofing For Steel Products

A new method of weatherproofing prefabricated sheet metal and metal shapes, such as pipe and culvert, has been introduced by the Coated Products Corp., Verona, Penna., to replace galvanizing and rolled bituminous applications for weatherproofing and protecting metals against corrosive atmospheric conditions, thus releasing the zinc used for galvanizing for vital war purposes and conserving bituminous materials.

This process uses Plastipitch, a pitch of improved plastic characteristics, which is applied in the Coated Products Corp. plant. The piece of steel to be protected is dipped into a bath of Plastipitch which is held at a temperature from 400 to 500 degrees F. The steel is kept in the bath until it reaches the same temperature as the bath and then is withdrawn at a variably controlled rate of speed in order to assure a uniform deposit. After withdrawal from the bath, the coated material is per-

mitted to cool for handling and then is covered with finely divided mineral such as slate dust which acts as an anti-stick.

It is stated that one of the features of this Coated Products process is its ability to provide special climatic or weather-resistant qualities as may be required to meet either arctic or subtropical conditions. This coating is available in various types of finishes and in a variety of colors, fineness and quality of mineral surfaces.

Although this process is applied only in the plant, a "cold dope" is available for making field repairs to pipe, culverts or other metal so treated, should the coating be injured in treatment or other handling.

A bulletin describing this material and process in detail, as well as a free sample, may be secured by interested contractors and engineers direct from the Coated Products Corp. by referring to this item.

*A strong offense is the best defense.
Buy War Bonds today!*

SMALL GASOLINE MOTORS HELP MAINTAIN Vital COMMUNICATION LINES!

On the front lines, as well as behind the front, our country's war program depends a great deal on constantly keeping communications open.

Here again, as in many other branches of military and civilian service, Briggs & Stratton 4-cycle, air-cooled gasoline motors ranging from 2/3 to 6 HP, play a vital role, furnishing dependable power for many uses.

Today, all the manpower and the production facilities of the Briggs & Stratton organization are devoted to the war program.

To the hundreds of thousands of civilian users of Briggs & Stratton motors we suggest that the life of the motors they now have can be prolonged — their performance kept at peak, by proper care and inspection and replacing broken or worn parts.

See your local dealer or an Authorized Service Station.
BRIGGS & STRATTON CORP.
Milwaukee, Wis., U. S. A.





23RD SEMI-ANNUAL MEETING
ASSOCIATED EQUIPMENT DISTRIBUTORS
EDGEWATER BEACH HOTEL CHICAGO, JUNE 8-10, 1942
PHOTOGRAPH BY CONTRACTORS AND ENGINEERS MONTHLY
EDGAR J. BENTENHEIM, PUBLISHER

This mid-summer AED meeting was a record-breaking mid-year gathering of distributors and manufacturers in both attendance and interest. Special credit is due to Tracy Harron, President, Ed Phillips, Vice President and Chairman of the Program Committee, and Carol Winchester, Secretary of the organization.

Equipment Repairs Are Dealers' Jobs

Among the government officials who addressed the Twenty-Third semi-annual meeting of the Associated Equipment Distributors in Chicago, June 8-10, was Hamilton O. Penn, Chief of the Used Construction Machinery Section, WPB. Mr. Penn reported that plans for a comprehensive nation-wide inventory of all construction and industrial equipment owned by non-military government agencies, which might be of use in the war program, were under way. He said that the rebuilding and repairing of this machinery would be handled by equipment distributors in the field in order to take advantage of their facilities and to help them stay in business despite the fact that war conversion has left them with practically no new machinery to sell.

"Proper and equitable distribution of machinery for repair and rebuilding will be effected through the regional WPB offices. There had been some talk of the government building its own plants for this work, but the new program of working through dealers eliminates that," stated Mr. Penn.

AED New Rental Rates Within OPA Maximum

The Rental Committee of the Associated Equipment Distributors has recently issued a revised compilation of "Rental Rates for Construction Equipment" which complies with the maximum price regulations of the Office of Price Administration.

The schedule is divided into three

sections: 1. Building Equipment Section, in accordance with Maximum Price Regulation No. 134; 2. The Tractor Section, in accordance with Maximum Price Regulation No. 134; and 3. The Building

Equipment Section and the Tractor Section in accordance with Maximum Price Regulation No. 136. All of the items are arranged in alphabetical order, making this schedule easy to use.

Copies of this Rental Rate Schedule may be secured from the Associated Equipment Distributors, National Press Building, Washington, D.C., at \$1.00 per copy postpaid.

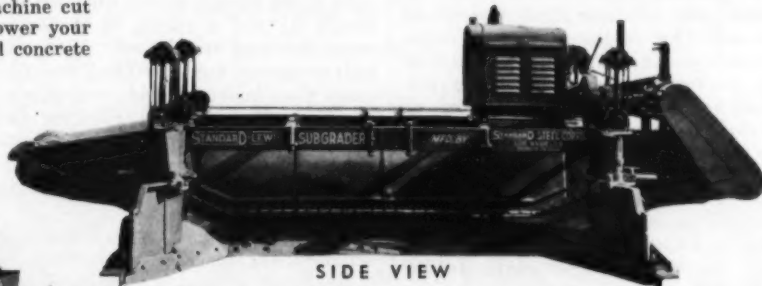
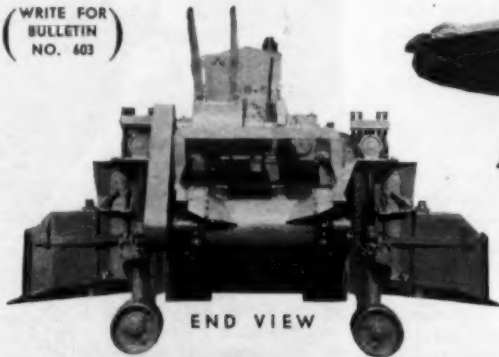
Make YOUR subgrading operations pay a profit:

A STANDARD Subgrader prepares subgrade at 50% to 90% saving!

One operator and a helper can prepare subgrade with this machine at the lowest cost ever attained.

Not only does the efficiency of this machine cut down subgrading costs, but it will also lower your costs of rough grading, form setting, and concrete or asphalt placing.

(WRITE FOR
BULLETIN
NO. 403)

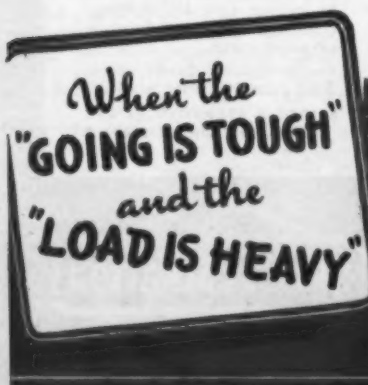


And dollar losses due to voids and improper subgrade will be entirely eliminated.

This machine is building most of the airports in the West.

Detailed records to substantiate this claim are obtainable from contractors using these subgraders. Write us for further information.

STANDARD STEEL CORPORATION 5001 So. Boyle
Los Angeles



Change of Address

(Mail to Contractors and Engineers Monthly, 470 4th Ave., New York, today)

From _____
(Former address)

To _____
(New address)

Name _____
Firm _____
Position _____

Directory of EQUIPMENT DISTRIBUTORS

The following cards (arranged by states) show the names of dealers in contractors' equipment and supplies, with a record of various lines handled.

On page 53 of this Directory are several cards which were received too late to include geographically in the listed pages.

GARLINGHOUSE BROS.

2416 E. 16th St. Los Angeles, Calif.
Southern California Distributors for

BROWNING—Truck Cranes, Shovels, Locomotive Cranes
DEMSTER—Dumpsters
DIAMOND IRON WORKS—Crushers, Portable Gravel

Plants
DAVEY—Compressors
LAMBERT-NATIONAL—Hoists and Cableways

McKERNAN-TERRY CORP.—Pile Hammers
A. LESCHEN & SONS—Wire Rope
NOVO—Engines, Pumps, etc.

OMAHA—Dragline Buckets
OWEN—Clamshell Buckets
RANSOME—Concrete Mixers, Pavers, etc.

UNIVERSAL—Panel Forms, Form Clamps, etc.
Manufacturers of

GAR-BRO—Concrete Carts, Wheelbarrows, Concrete Hoppers, Buckets, etc.

EDWARD R. BACON CO.

Folsom at 17th St.

San Francisco, Calif.

Aerial Emulation Distrib. American Concrete Grinders
"Berg" Concrete Surfaces
Byers Shovels, Cranes

Cleveland Trenchers
Debbie Derricks, Pitting
Erie Rollers
Gar-Bro Barrows, Carts

Herules Power Units
Hough Sweepers
Huber Rollers
Interstate Transways

Jackson Concrete Vibrators
Jaeger Mixers, Pumps
Holts, Paving Equip.

James Saw Benches
Kiebler Clamshell Buckets
Kiebler Lighting Plants

Member: Associated Equipment Distributors

NORRIS K. DAVIS

400 Seventh St. San Francisco, Calif.

Representing

DAVIS COMPANY—Large Tilling Mixers, 1, 2, 3, and 4-yd., Weight Batchers, Manual or

Full Automatic Operation, Ready-Mix Concrete Plants and Equipment, Motor Truck Concrete Mixers and

Carriers, Electrically Operated and Controlled Water Motors, Bins, Hoppers, etc.

W. E. GRACE MFG. CO.—Road Sweepers
HANSON CLUTCH & MACHY, CO.—Full Revolving

Shovels, Cranes, Draglines, 1/2, 3/4, 1, and 1 1/2-yd.
LE ROI CO.—Gasoline Power Units and Parts

MINN. STL. & MACHY, CO.—Twin City Engines, parts
NORTHERN CONVEYOR CO.—Stationary & Portable

Conveyor Units
O. K. CLUTCH & MACHY, CO.—Hoists & Compressors

SNOW REMOVAL EQ. CO.—Bobcats & Sierra Snow Plows

THE EARL WALKER CO. INC.—Bd. Oilers, Walker Bars

HARRON, RICKARD & McCONE COMPANY

2070 Bryant St., San Francisco

3850 Santa Fe Ave., Los Angeles

Representing

American—Hoisting Equipment
"Broderick & Bascom"—Wire Rope

E. S. & Dippers, Dragline Buckets, etc.
Eskel—Plaster Mixers

Rollers, Hoists, Mixers
Gorman-Rupp—Pumps
Insley—Excavators

C. S. Johnson—Bins and Batches
Kiebler—Shovels, Mixers
"Not handled in Los Angeles territory."

Member: Associated Equipment Distributors

THE PAVING SUPPLY AND EQUIPMENT COMPANY

10th & Girard Sts. N.E., Washington, D.C.

657-59 East 25th St., Baltimore, Md.

Exclusively

J. D. Adams Co.
Barber-Greene Co.

Buckeye Traction Ditcher Co.
Bucyrus-Erie Co.
Buffalo-Springfield Roller Co.

C. H. & E. Mfg. Co.
Cleveland-Brooks Co.
Construction Machinery Co.

International Harvester Co.
Kinney Manufacturing Co.
White Mfg. Co.

Everything in construction equipment.
Member: Associated Equipment Distributors

LLEWELLYN MACHY, CORP.

1330 N. Miami Ave., Miami, Florida

Allied Companies
Atlas Imp. Diesel Eng. Co.
Austin-Western Rd. Machy, Co.

Barber-Greene Co.
Bystone Mfg. Co.
Browning Mfg. Co., Inc.

Century Electric Co.
Climax Engrs. Co.
Comm'l Shearing & Stamp-

ing Co.
Copey Mfg. Co.
Cruker-Wheeler Elec. Mfg. Co.

Henry Diston & Sons, Inc.
Deise Mfg. Corp.
Farm & Home Machy, Co.

Goulds Pumps, Inc.
W. W. Grainger, Inc.
Independent Pave. Tool Co.

Ingersoll-Rand Co.
Jaeger Machine Co.
Eds. E. Johnson, Inc.

LeRoy Co.
Link-Bolt Co.
Littleford Bros.

Marshallville Mfg. Co.
Merse Chain Co.
F. E. Myers & Bros. Co.

Novelty Steam Boiler Wks.
Novo Engine Co.
Ohio Pattern Wks. & Fdy.

Owen Bucket Co.
Page Engrs. Co.
Permutit Co.

Robert Filter Mfg. Co.
Sageen Derrick Co.
A. P. Smith Mfg. Co.

Square D Co.
Stearns Mfg. Co.
Stearns Mfg. & Engine Co.

Viking Pump Co.
Wall Hope Works, Inc.
Whitehead Bros. Rubber Co.

Wickwire Spencer St. Corp.
Wisconsin Motor Co.
Yale & Torrey Mfg. Co.

Yates-American Machine Co.

YANCEY BROTHERS, INC.

634 Whitehall St., S. W.

Atlanta, Ga.

American Manganese Jaws
American Cable Wire Rope
Barber-Greene Ditchers, Com-

pressors, Asphalt Equipment
Barnes Pumps
Buffalo-Springfield Rollers

"Caterpillar" Tractors, Grad-

ers, Power Units, etc.
Cedar Rapids Crushers
Clyde Hoists

Conveyer Kettles, Tools
Duxey Saw Rigs
Grace Sweepers, Tank Car

Hoisters
Ingersoll-Rand Air Compres-

sors, Air Tools
Jackson Vibrators
Johnson Bros. Batches, Bulk

Conent Plants
Killefer Rippers, Harrows,
Drag Scrapers, Flows

Kinney Asphalt Distributors
LaPlant-Choate Bulldozers,
Trailbuilders, Tamping

Rollers
LeTourneau Carry-all Scrap-

ers, Angledozers, Rooters
Metallum Road, Sidelwalk,
Curb & Gutter Forms

Page Dragline Buckets
Red Star Wheelbarrows, Con-

crete Carts
Rea Mixers, Pumps, Pavers

Rolls Shores
Thew-Lorain Shovels
Timken Drill Bits & Rods

Ward Road Flows
"Williams" Buckets
Member: Associated Equipment Distributors

F. H. BURLEW COMPANY

3401 South Hoyne Ave., Chicago, Ill.

Telephone: Virginia 1100

BATES Wire Ties, etc.
BYERS Crawler Cranes,
Shovels, Draglines

BEESSE BROS. Hoists
CHAIN BELT Mixers,
Pavers, Pumps, Elevators

Pumpcrete, Moto Mixers
ERIE Steel Bins, Batches,
Aggregators, Plants

McKernan-Terry Corp. (Divisions)
McKERNAN-TERRY—Pile Hammers, Extractors

LAMBERT-NATIONAL—Hoists, Cableways
STEELE & CONDUCT—Special Machinery

Wheelbarrows, Hoss, Cable Rope, Tarpsulins,
Vibrators, etc., carried in stock

Member: Associated Equipment Distributors

CHICAGO CONSTRUCTION EQUIPMENT COMPANY

8020 S. Halsted St., Chicago, Ill.

Sales—Rentals—Service

Aerial—Tar Kettles
Carver-Centrifugal Pumps
Centaur—H-Way Motors

C. M. & E.—Saw Rigs, Hoists,
Pumps
Cleveland—Rock Drills, Pav-

ing Breakers, Air Tools
Gallen—Bd. Machy, Graders
Motor Patrols, Rollers

Drills, Saw
Syntren—Comp. Vibrators,
Generators
Williams—Buckets

Clamshell and Dragline Buckets, Belting, Rubber
Hose, Road Torches, Wheelbarrows, Scoops,
Spades, Shovels, Tools, Supplies

O. T. CHRISTERSON CO.

3900 So. Wabash Ave. Chicago, Ill.

Representing

BLAW-KNOX—Road Forms, Bins, Batches, Finishing
Machines, Buckets, Truck Mixers, Spreaders, Vibrators

C. H. & E.—Road Pumps, Saw Rigs, 2-Ton Rollers
CHICAGO PNEUMATIC TOOL CO.—Compressors, Air

Tools, Hoss
CLEVELAND—Subgraders, Straight Edges, Finishing
Tools

GORMAN-RUPP—Self Priming Centrifugal Pumps, Road
Pumps

INSLEY MFG. CO.—Cranes, Shovels, Wagons, Conc.
Carts, Derricks, Concrete Buckets

KOENIG—Mixers, Pavers, Cranes, Shovels, Dumpsters,
Mud Jacks, Trail Dumpers, Wheelers, Longitudinal Fin-

isher
KWIK-MIX—Concrete and Bituminous Mixers
PARSONS—French Machines, Backfillers, Turbo Mixers

Concrete Carts, Wheelbarrows, Supplies

PEORIA TRACTOR & EQUIPMENT CO.

400 Franklin Street Peoria, Illinois

Representing

Athey Truss Wheel Co.
Caterpillar Tractor Co.

Killefer Mfg. Corp.
LaPlant-Choate Mfg. Co.

R. G. LaTourneau, Inc.
Thew Shovel Co.

Trackson Co.
Williamette Hyster Co.

Universal Crusher Company
Telephone 6177

INDIANA EQUIP. CO., INC.

327-329 West Market St., Indianapolis, Ind.

Representing

ATHEY TRUSS—Wagons,
Bulldozers
BUFFALO-SPRINGFIELD

—Rollers
"CATERPILLAR"—Road
Machinery
"CATERPILLAR"—Trac-

tors
CHAIN BELT CO.—Mixers,
Pumps
DIAMOND—Crushers,
Screens

LA PLANT-CHOATE—Wag-

ons, Scrapers, Bulldozers
LE TOURNEAU—Scrapers,
Buggies, Bulldozers

OWEN—Clamshell Buckets
PAGE—Dragline Buckets

SAUERMAN—Cableways,
Power Scrapers
SULLIVAN MACHY.—Air

Compressors
THEW—Shovels, Draglines
TRACKSON—Tracktravels,
Pipe Layers

WHITE—Vibrators, Tar
Kettles
Member: Associated Equipment Distributors

GIERKE-ROBINSON CO.

4th & Ripley Sts. Davenport, Iowa

Representing

BARCO—Gasoline Hammers
BLAW-KNOX—Steel Road, Curb and Gutter Forms,
Bins, Batches, Clamshell Buckets, Truck Turnbells,

Ord Concrete Road Finishers
CHAIN BELT—Mixers, Pavers, Pumps, Elevators
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 Barro Mfg. Co.—Centrifugal Diaphragm and Force Pumps
 Blaw-Knox Co.—Clamshell Buckets, Road Forms, Material and Cement Bins
 "Caterpillar"—Tractors and Road Machinery
 R. G. LeTourneau, Inc.—Carralls, Buggies
 LaPlant-Choate Mfg. Co.—Bulldozers, Trailbuilders, Carralls, etc.
 Master—Elec. Gas. Concrete Vibrators
 Northwest Engineering Co.—Gasoline Cranes, Shovels and Draglines
 Ord—Road Finishing Machine
 Ransome Concrete Machinery Co.—Concrete Mixers and Appliances

Member: Associated Equipment Distributors

HOWARD W. READ CORP.

N. W. Cor. 25th and Wharton Sts., Philadelphia, Pa.

Distributors

Ralph B. Carter Co.	Quick-Way Truck Shovel
Inley Mfg. Co.	Mfg. Co.
Kuehling Co.	Vulcan Iron Works, Inc.—File Hammers

Also Carry in Stock: Hoisting Engines, Gas and Steam

SERVICE SUPPLY CORPORATION

20th and Venango Sts., Philadelphia, Pa.

Representing

Bay City Shovels, Inc.—Shovels, Cranes, etc.
Beach Mfg. Co.—Saw Rigs
Chicago Pneumatic Tool Co.—Compressors, Air Tools
W. F. Hebard & Co.—Shop Mules
Hercules Company—Road Rollers
International Harvester Co.—Indus. Wheeltype and Crawler Tractors
Jaeger Machine Co.—Mixers, Truck Mixers, Pumps, Blows
Top Pavers, Finishing Machines
C. S. Johnson & Co.—Blind, Batches, Cement Handl. Mq.
Lambert-National—Hoists
Littlefield Bros.—Road Oil Distrib. Heating Kettles, etc.
McKiernan-Terry Corp.—Pile Drivers
N. P. Nelson Iron Wks., Inc.—Loaders & Belt Conveyors
The Parsons Company—Trench Machines, Snow Plows
Pioneer Engineering Wks., Inc.—Roll Crushers
Silent Hoist Winch & Crane Co.—Crane Cars, Winches, Capstans, Car Pullers, etc.

Member: Associated Equipment Distributors

J. JACOB SHANNON & CO.

1744—Sedgley Avenue—1744

PHILADELPHIA

Representing

Burch Corp.—Snow Plows, Maintainers
C. H. & E. Mfg. Co.—Saw Rigs, Rollers, Hoists
Clyde Iron Wks., Inc.—Gas, Elec., Steam Hoists
Concrete Surfacing Machinery Co.—Hrg. Surfactors
Electric Tamping Co.—Comp. Mixers
Easick Mfg. Co.—Plaster Mixers
Gardner-Denver Co.—Air Compressors
Gleason Brothers Co.—Concrete Mixers
Huber Mfg. Co.—Road Rollers
Jey Mfg. Co.—Snow Loaders
Link-Belt Speed-Matic Shovels, Cranes, Draglines
Richmond Sorey Ancher Co.—Turns
W. A. Riddell Corp.—Road Graders
John A. Roebing's Sons Co.—Wire Ropes, Fittings
Saugen Derrick Co.—Derricks and Winches
Shannon-Derricks and Derrick Fittings
Sterling Mfg. Corp.—Pumps, Hoists, Generators
Van Dorn Iron Works Co.—Sweepers

Member: Associated Equipment Distributors

NIXON-HASSELLE COMPANY, INC.

Contractors' Equipment

Chattanooga Tennessee

Representing

Archer Towers, Spouting Equipment
Austin-Western Graders, Crushers, Rollers, Scrapers, etc.
Blaw-Knox Batters, Buckets, etc.
Brook Tank Car Heaters, etc.
Bucyrus-Erie Bulldozers, Scrapers, etc.
Four Wheel Drive Trucks
Hais Mfg. Co.—Conveyors, etc.
Hough Road Sweepers, Sprinklers, etc.
Murphy Diesel Engines

Member: Associated Equipment Distributors

BROOKS EQUIP. & MFG. CO.

Knoxville 408 Davenport Rd. Tennessee

Representing

J. D. Adams Co.
Buckeye Tractor Ditcher Co.
Bucyrus-Erie Co.
Columbia Rock Drill Co.
Columbus Conveyor Co.
Construction Machy. Corp.
Savoy Compressor Co.
Electric Tamping & Equip. Co.
Euclid Road Machy. Co.
Geo. Hais Mfg. Co.
Heltzel Steel Form & Iron Co.
Hercules Co.
Hoar Accessories Co.

Member: Associated Equipment Distributors

OSBORNE EQUIPMENT COMPANY

525 State Street, Knoxville, Tennessee

Distributors for

American Cable Div., Amer-
ican Chain & Cable Co.
Ariens Co.
Boston Woven Hose & Rubber Co.
Buckeye Tractor Ditcher Co.
J. I. Case Co. (Industrial)
Cleveland Tractor Co.
Davenport Beiler Corp.
DeSoto Foundry Inc.
Gallion Iron Wks. & Mfg. Co.
Gardner-Denver Co.
Holt Co.
Hobart Bros. Co.
Hug Co.
Iowa Mfg. Co.

Member: Associated Equipment Distributors

FLORIDA-GEORGIA TRACTOR CO.

Jacksonville—Lakeland—Miami

American Cable Div., Amer-
ican Chain & Cable Co.
Buckeye Tractor Ditcher Co.
Bucyrus-Erie Co.
Columbia Rock Drill Co.
Columbus Conveyor Co.
Construction Machy. Corp.
Savoy Compressor Co.
Electric Tamping & Equip. Co.
Euclid Road Machy. Co.
Geo. Hais Mfg. Co.
Heltzel Steel Form & Iron Co.
Hercules Co.
Hoar Accessories Co.

Member: Associated Equipment Distributors

GENERAL CONSTRUCTION EQUIPMENT CORP.

5040 So. Halsted St., Chicago, Ill.

Representing

Aerol Burner Co., Inc.
Advance Machine Co., Inc.
American Saw Mill Machinery Co.
Atlas Conveyor Co.
Cleveland Farmgrader Co.
Construction Machinery Co.
Concrete, Mortar, Bituminous Mixers, Pumps, Screws, Bins & Batches, Wheelbarrows, Carts, Hoists
Also complete line of contractors' supplies, including tools, wire rope, Ursprung, salamanders

Member: Associated Equipment Distributors

WILSON-WEESNER-WILKINSON CO.

Nashville

Tennessee

Representing

Allis-Chalmers Mfg. Co.
Ames Baldwin Wyoming Co.
Baker Mfg. Co.
Barber-Greens Co.
Blaw-Knox Co.
Cleveland-Brooks Co.
Clyde Iron Works, Inc.
E. D. Etnyre Co., Inc.
Gorman-Rupp Co.

Member: Associated Equipment Distributors

NASHVILLE-KNOXVILLE

Warehouse Stocks of Service

Reinforcing Steel and Mesh

Member: Associated Equipment Distributors

BROWNING-FERRIS MACHY. CO.

205 Exposition Ave. Dallas, Texas

Texas at Rice Sts. Houston, Texas

Representing

Cleveland Trencher Co.
Festo Company—Pavers
Gallion Iron Works & Mfg. Co.
Bucyrus-Erie—Scrapers, Bulldozers
Ingersoll-Rand Company
International Tractors
Iowa Mfg. Co.—Cedar Rapids Line
Jaeger Machine Company
Jaeger Superior Mfg. Co.
Littlefield Brothers
The Owen Bucket Company
Page Engineering Co.
Sterling Wheelbarrow Co.
Thaw Shovel Company
Truck Company

Member: Associated Equipment Distributors

R. B. EVERETT & CO.

3112-18 Harrisburg Blvd. Houston, Texas

Representing

BLAW-KNOX Road Plant Equipment, Bins, Cans, Shell Buckets
AMERICAN Helming Machinery
"P. & M." Gasoline Cranes
McKiernan-Terry Pile Drivers, etc.
CONNERY Asphalt Equip.
CHAIN BELT Concrete Mixers, Saw Rigs, Pavers
HOVO Engines, Hoists, Pumps
"RED STAR" Wheelbarrows

Member: Associated Equipment Distributors

PHILLIPS MACHINERY CO.

900 East Cary St. Richmond, Va.

Representing

Aerol Burner Co., Inc.
Austin Machinery Corp.
Broderick & Bassom Rope Co.
Butler Bin Co.
Chain Belt Co.
Cleveland Trencher Co.
Clyde Iron Wks., Inc.
Concrete Surf. Machy. Co.
Independent Pneu. Tool Co.
Jackson Mfg. Co.

Member: Associated Equipment Distributors

STAR MACHINERY CO.

1741 First Ave., South Seattle, Wash.

Representing

Advance Machine Co.
Air Reduction Sales Co.
American Helmt & Derrick Co.
American-Marsh Pumps, Inc.
Banks Brothers, Inc.
Chain Belt Co.
C. H. & E. Mfg. Co.
DeWitt Products Corp.
Garlinghouse Bros.
Gordon Smith, Inc.
Hercules Motors Corp.
Independent Pneu. Tool Co.
Master Vibrator Co.
Oster Mfg. Co.
Red Star Mfg. Co.
Read-Pratt Corp.
John A. Roebing's Sons Co.
Whitman Mfg. Co.
Wisconsin Motor Corp.
Witte Engine Corp.
Worthington Pump & Machy. Corp.

Member: Associated Equipment Distributors

CONSTRUCTION EQUIPMENT CO.

1118-1124 Ide Ave., Spokane, Wash.

Aerol Burner Co., Inc.
Archer Iron Works
Bates Wire Ties
Bebe Bros.
Blystone Mfg. Co.
Broderick & Bassom Rope
Bucyrus-Erie Co.
Buffalo-Sprgld. Roller Co.
Butler Bin Co.
Chain Belt Co.
Climax Eng. Co.
Concrete Surf. Machy. Co.
D-A Lubricant Co.
Detroit Graphite Co.
R. E. Dietz Co.
Duff-Norton Mfg. Co.
Fairbanks, Morse & Co.
Fate-Root-Heath Co.

Member: Associated Equipment Distributors

BOEHCK EQUIPMENT CO.

2404 W. Clybourn St. Milwaukee, Wis.

Representing

American Helmt & Derrick Co.
Bucyrus Machine Co.
Caine Steel Co.
Centaur Co.
Concrete Surfacing Machy. Co.
Electric Tamping & Equip. Co.
Hauk Mfg. Company
Hercules St. Products Co.
Iowa Manufacturing Co.
Independent Pneumatic Tool Co.
Jaeger Machine Co.
C. S. Johnson Company

Member: Associated Equipment Distributors

CUNNINGHAM-ORTMAYER CO.

429 W. Michigan St. Milwaukee, Wis.

Butler Bins, Batches
Case Tractors and Mowers
Cleveland Farmgrader Far-
ing Equipment
Coffing Hoists
Chloride "Dow-
Saler"
"Danco" Salamanders
Flexible Road Joint Ma-
chines
Gallen Graders, Rollers and
Spreaders
Good Roads Snow Plows
Gorman-Rupp Pumps
Gravelier Crushers and
Perforators
Handlan 100-Hour Lantern,
Torches
Heltzel Steel Road Forms
Ingersoll-Rand Air Com-
pressors, Tools

Member: Associated Equipment Distributors

DROTT TRACTOR CO., INC.

Milwaukee Wisconsin

Representing

Allis-Chalmers Tractors,
Graders, Speed Patrols,
Hauling and Power Units
Baker Bulldozers, Grade-
builders, Snow Plows, etc.
Century Graders
Drott Equipment (All-
Service Corp.) Angle-
drills, Bulldozers, Tractor
and Snow Plow Equip-
ment, etc.
Gar Wood Scrapers, Rippers,
etc.
General Motors Diesel Pack-
aged Power Units
Garrison Fluters
Hais Gravel and Snow Load-
ing Equipment, Conveyors,
etc.
Hercules Portable Melting Ket-
tles
Hercules Rollers

Member: Associated Equipment Distributors

HUNTER TRACTOR & MACHY. CO.

327 So. 16th St. Milwaukee, Wis.

Exclusive Distributors

Aerol Burner Co.
American Steel & Wire Co.
Barco Mfg. Co.
Bates Valve Bag Corp.
Bebe Bros.
Blaw-Knox Co.
Buckeye Tr. Ditcher Co.
Buffalo Spg'd Roller Co.
Chain Belt Company
Clyde Iron Works, Inc.
Dempster Bros., Inc.
Kelley Electric Mach. Co.

Member: Associated Equipment Distributors

P. A. NEFF

1920 N. W. Miami Court, Miami, Fla.

Sales—Service—Rentals

Butler Bin Co.—Bins, Batches, Scales
J. I. Case—Industrial Contractors
Chain Belt Co.—Mixers, Pumps, Pavers
De Walt Products Corp.—Wood Working Machines
Independent Pneumatic Tool Co.—Air Tools, Electric
Drills, Hammers, Hand Saws
Lansing Co.—Wheelbarrows, Concrete Carts
Lo Roi Co.—Air Compressors
Mall Tool Co.—Vibrators, Saws, Terrazzo Machines

Miscellaneous Contractors Supplies

Member: Associated Equipment Distributors

R. G. MOELLER COMPANY

14415 Meyers Rd., Detroit, Mich.

Representing

Bay City Shovels, Inc.
McKiernan-Terry Corp.
The Unistrut Corp.
Draw Corp.
Flexible Road Joint
Machinery Co.
Heltzel Steel Form &
Hercules Motors Corp.
Homestead Valve Mfg. Co.
Ingersoll-Rand Co.
J. F. Kistler Co.
Lincoln-Schuster Floor
Machy. Co.

Member: Associated Equipment Distributors

J. E. INGRAM EQUIP. CO.

1146 West Laurel St. San Antonio, Texas

Representing

Barber-Greens Co.
Buckeye Tractor Ditcher
Co.
Bucyrus-Erie Co.
Chain Belt Co.
DeSoto Foundry Co.
Dux Mfg. Co.
Etnyre & Co., E. D.

Member: Associated Equipment Distributors

A. L. GUILLE

825 Wainwright Bldg., Norfolk, Va.

Representing

Barber-Greens Co.—Conveyors, Loaders, Black-
top Mixers, Finishers
Heltzel Steel Form & Iron Co.—Steel Rd. Forms, Curb &
Gutter Forms, Aggregate Bins, Bulk Cement Bins, etc.
Flexible Road Joint Machinery Co.—Concrete Flexplane
Finishers, Joint Machines
Fate-Root-Heath Co.—Plymouth line of Internal Combustion
and Diesel Electric Locomotives

Member: Associated Equipment Distributors

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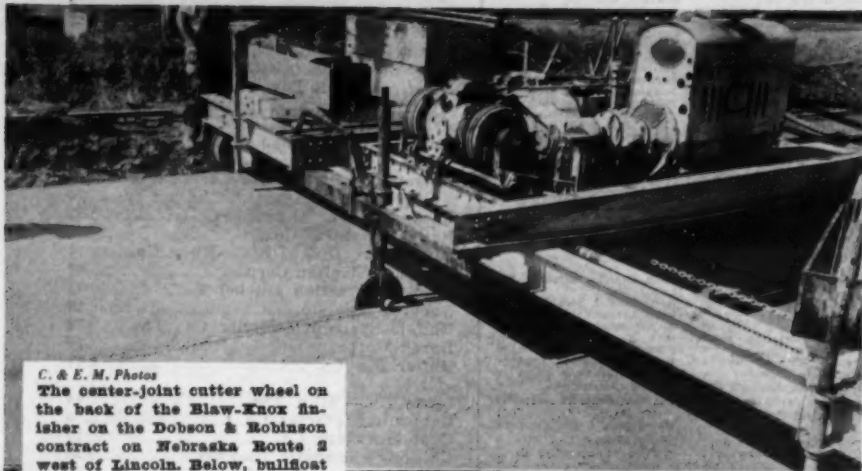
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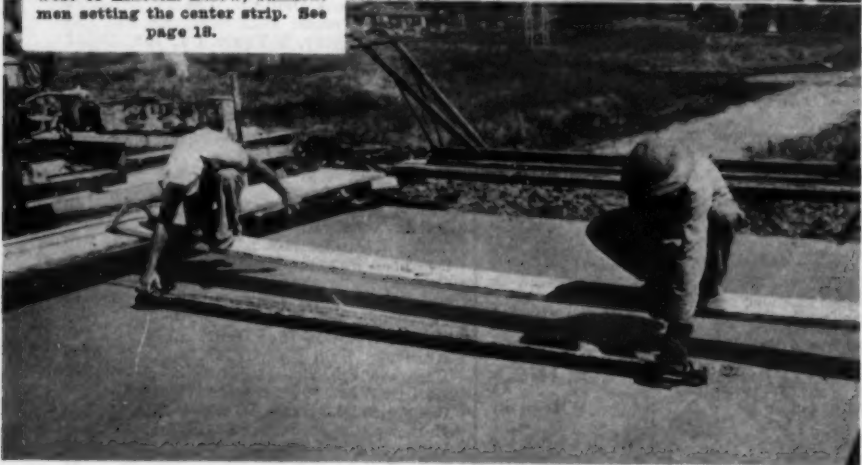
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Contractors and Engineers Monthly



C. & E. M. Photos
The center-joint cutter wheel on the back of the Blaw-Knox finisher on the Dobson & Robinson contract on Nebraska Route 2 west of Lincoln. Below, bulldozer men setting the center strip. See page 18.



C. & E. M. Photos
Concrete in the making and delivered to the forms for a standard concrete bridge built by Bonesteel & Hyde on U.S. 77 in South Dakota. Aggregates and mixer were parked on the approach fills. See page 24.



C. & E. M. Photo
Excavating white sugar sand from beneath an overburden of 6 feet of red sand-clay for the hot mix for runways at a southern airport. See page 1.



C. & E. M. Photo
The assembled processing plant of Megarry Bros. at Detroit Lakes, Minn., for producing plant-mixed stabilized base and, later, oil-mix top for an 11.2-mile project on Minn. 34. See page 2.



Left, a Lima shovel loading blasted rock within the excavation limits on a water-supply dam project in the west. At right, the type of excavation at the left abutment. See page 2.

